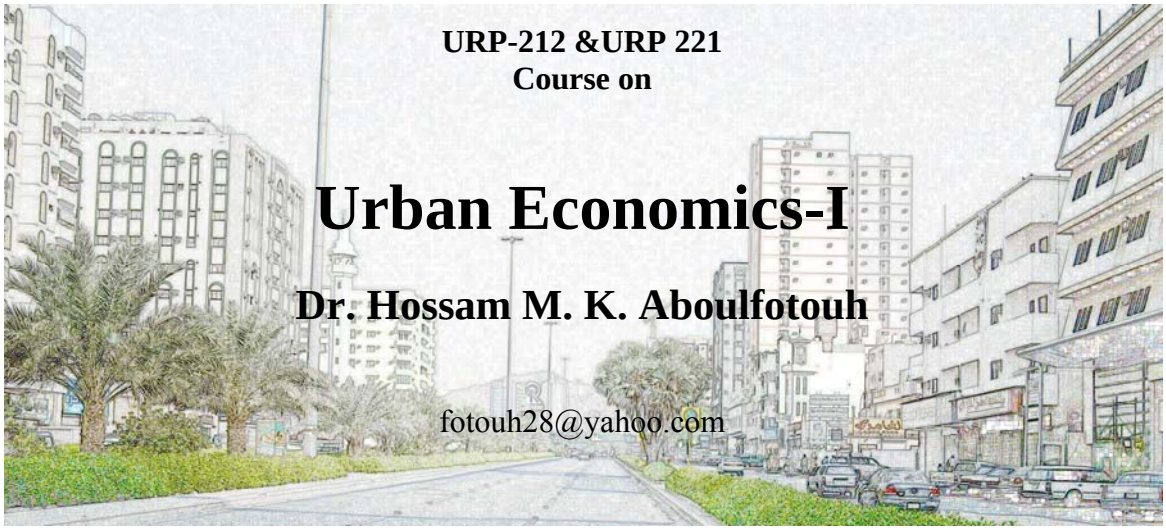
KING ABDULAZIZ UNIVERSITY
Faculty of Environmental Design
Department of Urban & Regional Planning



URP-212 &URP 221
Course on

Urban Economics-I

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Lecture note#2: Plotting the Demand Graphs in Excel Sheets.

In lecure-1 we mentioned two equations that we can use to demonstrate the data of demand schedule in an XY graph. The first is the equation of the fitting curve and the second is the equation of the fitting line.

2-1 Plotting a graph using the equation of a fitting demand curve:

The following is the equation of a fitting demand curve.

$$Y = T * X^{-E}$$

Where T is constant and E is the price elasticity of demand. Since the price P is plotted on the Y axis, and the quantity Q is plotted on the X axis; the above equation could be written as follows:

$$P = T * Q^{-E}$$

Notice that, if the price elasticity of demand E=1 (and X^{-1} means 1/X), the constant T= X*Y = Revenue.

Example:
If T=5000, E =0.65 and the values of X or (Q) are: 100, 300, 500, 700, 950 and 1200; the corresponding values of Y (or P) could be reckoned using the equation $Y=T*X^{-E}$ as shown in fig-1, and accordingly plotting the graph of the fitting demand curve.

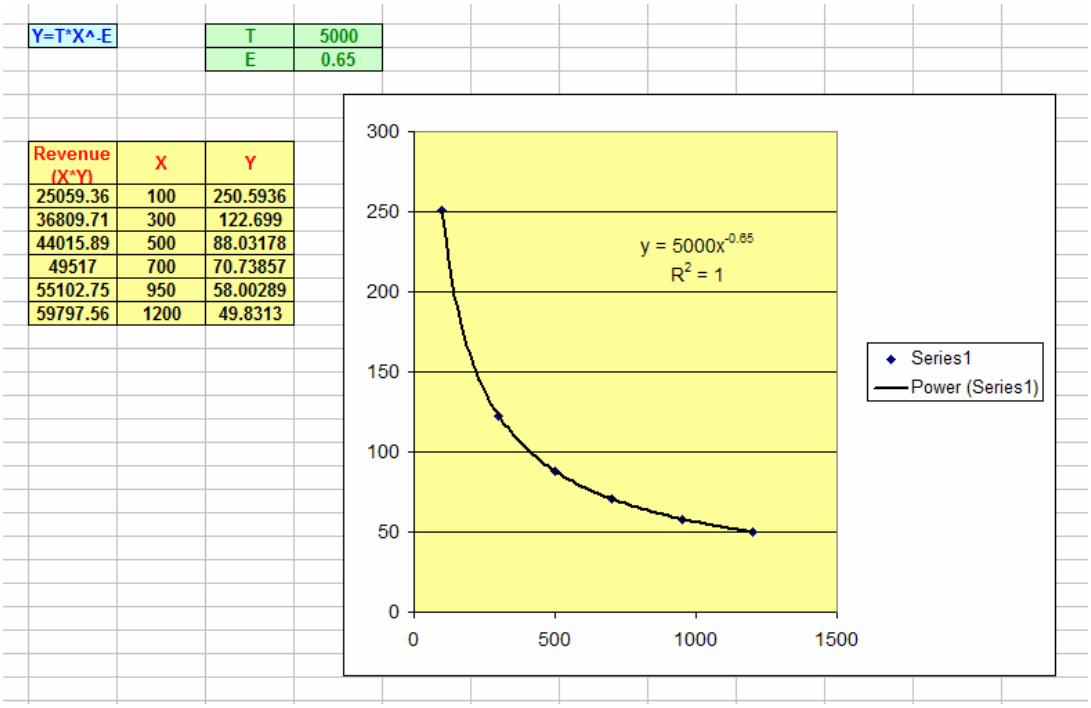

Figure-1: Plotting a graph of a fitting demand curve.

Assignment-1:
If T=6000 and E =1, in an Excel sheet use the same values of X to reckon the corresponding values of Y, and see if there is any change in the values of the revenue for each price P (Y), and then plot the fitting curve similar to what is shown in fig-1 above.

2-1 Plotting a graph using the equation of a fitting demand line:

The following is the equation of a fitting demand line.

$$Y = a - b\,X$$

Where $a = P_o$ and b is the slope of the line (or $tan\ \varphi$), which equals P_o/Q_o. Since P_n is plotted on the Y axis and Q_n is plotted on the X axis, the last equation could be written as follows.

$$P_n = P_o - [(P_o/Q_o) * Q_n]$$

Example:
Using the mentioned basic data of housing demand (see lecure-1), if $a = P_o = 3000$; & $b = P_o/Q_o = 3000/4500 = 2/3 = 0.6667$; and the values of X or (Q_n) are: 0, 500, 1500, 2500, 3500 and 4500; the corresponding values of Y (or P_n) could be reckoned using the equation $Y = a - b\,X$ as shown in fig-2, and accordingly plotting the graph of the fitting line of demand.

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Y=a-bX		a	3000
		b	0.6667

Revenue (X*Y)	X	Y
0	0	3000
1333333	500	2666.667
3000000	1500	2000
3333333	2500	1333.333
2333333	3500	666.6667
0	4500	0

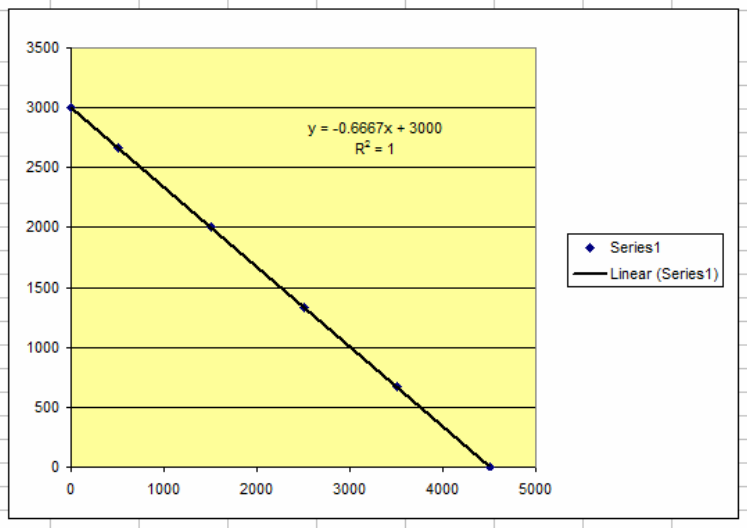

Figure-2: Plotting a graph of a fitting (demand) line.

Assignment-2:
If a=2250 and b = 0.5, in an Excel sheet use the same values of X to reckon the corresponding values of Y, and see if there is any change in the values of the revenue for each price P (Y), and then plot the fitting-line similar to what is shown in fig-2 above. Besides, in the same excel sheet put b = 0.0 and see if there is any change in the values of the price Y (P) and the corresponding values of revenues.

In the coming lecture, we will talk about how to reckon the maximum design capacity of a multi-story car parking in the city center, using the equation of a fitting demand line.

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