6. From the following table giving the quantity demanded of a commodity (Y), its price (X1), and the consumers income (X2) from 1986 to 2005, a) estimate the regression equation of Y on X1 and X2, b) test at the 5 % level for the statistical significance of the slope parameters, c) find the unadjusted and the adjusted coefficients of determination and d) test at the 5 % level for the overall statistical significance of the regression. Show all your results to three decimal places.

|  |  |  |  |
| --- | --- | --- | --- |
| Year | Y | X1 | X2 |
| 1986 | 72 | $10  | $2,000  |
| 1987 | 81 | 9 | 2100 |
| 1988 | 90 | 10 | 2,210 |
| 1989 | 99 | 9 | 2,305 |
| 1990 | 108 | 8 | 2,407 |
| 1991 | 126 | 7 | 2,500 |
| 1992 | 117 | 7 | 2,610 |
| 1993 | 117 | 9 | 2,698 |
| 1994 | 135 | 6 | 2,801 |
| 1995 | 135 | 6 | 2,921 |
| 1996 | 144 | 6 | 3,000 |
| 1997 | 180 | 4 | 3,099 |
| 1998 | 162 | 5 | 3201 |
| 1999 | 171 | 4 | 3,308 |
| 2000 | 153 | 5 | 3,397 |
| 2001 | 180 | 4 | 3,501 |
| 2002 | 171 | 5 | 3,689 |
| 2003 | 180 | 4 | 3,800 |
| 2004 | 198 | 4 | 3,896 |
| 2005 | 189 | 4 | 3,989 |

1. If the regression of Y on X1 and X2 is run in double log form for the data of Problem 5, the results are as follows;

In Yt= -0.533 - 0.389 ln X1t + 0.769 ln X2t

 (-3,304) (4,042)

‾R2= 0.95054 F= 183,582

Compare the above results with those of problem 6. Which are better? Why?

Integrating problem

Starting with the data for problem 6 and the data on the price of a related commodity for years 1986 to 2005 given below, we estimated the regression for the quantity demanded of a commodity which now relabel Q^x, on the price of the commodity which we now label Px consumers income which we now label Y and the price of the related commodity Pz, and we obtained the following results.

Year 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995

Pz 14 15 15 16 17 18 17 18 19 20

Year 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

Pz 20 19 21 21 22 23 23 24 25 25

Qx^= 121.86-9.50Px+0.04Y-2.21Pz

 (-5.12) (2.18) (-0.68)

R2=0.9633 F= 167.33 D-W= 2.38

a). Explain why you think we have chosen to include the price commodity Z in the above regression. b) Evaluate the above regression results. c) What type of commodity is Z? Can you be sure?