|  |  |  |
| --- | --- | --- |
| Year | Consumption | Transfers |
| 1959 | 318127 | 22.9 |
| 1960 | 332293 | 24.4 |
| 1961 | 342653 | 28.1 |
| 1962 | 363761 | 28.8 |
| 1963 | 383135 | 30.3 |
| 1964 | 411735 | 31.3 |
| 1965 | 444288 | 33.9 |
| 1966 | 481769 | 37.5 |
| 1967 | 508694 | 45.4 |
| 1968 | 558727 | 53 |
| 1969 | 605516 | 58.8 |
| 1970 | 648948 | 71.6 |
| 1971 | 702414 | 85.2 |
| 1972 | 770724 | 94.6 |
| 1973 | 852512 | 108.1 |
| 1974 | 932378 | 128.4 |
| 1975 | 1030342 | 163 |
| 1976 | 1149774 | 176.9 |
| 1977 | 1278414 | 188.7 |
| 1978 | 1430394 | 202.5 |
| 1979 | 1596257 | 226.4 |
| 1980 | 1762904 | 270.2 |
| 1981 | 1944151 | 307 |
| 1982 | 2079306 | 342.3 |
| 1983 | 2286430 | 369.4 |
| 1984 | 2498404 | 378.3 |
| 1985 | 2712585 | 403.1 |
| 1986 | 2895167 | 428.4 |
| 1987 | 3105337 | 447.8 |
| 1988 | 3356583 | 476.1 |
| 1989 | 3596666 | 519.2 |
| 1990 | 3831501 | 573.1 |
| 1991 | 3971236 | 649.1 |
| 1992 | 4209653 | 729.2 |
| 1993 | 4454704 | 776.5 |
| 1994 | 4716394 | 810.1 |
| 1995 | 4968988 | 860.1 |
| 1996 | 5237499 | 902.4 |
| 1997 | 5529283 | 934.4 |
| 1998 | 5856036 | 955 |
| 1999 | 6250217 | 988.4 |

1. Open the [Cons Trans 59 - 00.xls](http://internet.ggu.edu/~fchao/math104/session8/Cons_Trans_59-00.xls) file. Use the BEA consumption and transfers data to investigate whether heteroscedasticity or autocorrelation is present in the model using the graphical approach (consumption as the dependent variable). Which answer best represents the degree of autocorrelation in the model? Using EXCEL or *PHStat*2, answer the following:

a) Neither autocorrelation nor heteroscedasticity appear to be present in the model.
b) Autocorrelation appears to be present in the model.
c) Heteroscedasticity appears to be present in the model.
d) Both autocorrelation and heteroscedasticity appear to be present in the model

1. Refer to the BEA consumption and transfers data from the [Cons\_Trans\_59-00.xls](http://internet.ggu.edu/~fchao/math104/session8/Cons_Trans_59-00.xls) file which was used in Problem 1, above. Analyze the signs of the residuals and values of the residuals to determine which best describes the pattern in the residuals

a) The signs of the residuals are randomly arranged and the values of the residuals remain constant.
b) The signs of the residuals reveal a non-random pattern and the values of the residuals remain constant.
c) The signs of the residuals reveal a non-random pattern and the values of the residuals increase as the transfers increase.
d) The signs reveal are randomly arranged and the values of the residuals increase as the transfers increase.

1. Use the Cons Trans 59-00.xls file, which was, used in Problems 1 & 2 and *PHStat*2 to calculate the d statistic. (Refer to the dialogue box on pages 537-538 of the Levine textbook.) The calculated d-statistic is:

a) 0.635267892
b) 1.355377418
c) 0.877545537
d) 0.355377418

1. The dl and du at a 0.01 level of significance in the Durbin-Watson test for autocorrelation are:

a) 1.44 & 1.54, respectively.
b) 1.48 & 1.57, respectively.
c) 1.25 & 1.34, respectively.
d) 1.24 & 1.42, respectively.

1. Use the results of the Durbin-Watson test in Problems 3 & 4 to determine if autocorrelation exists in the model. Test at the 0.01 level of significance. The statistical conclusion is:

a) No evidence of autocorrelation.
b) No conclusion can be drawn.
c) Autocorrelation exists in the model.
d) Not enough information to determine if autocorrelation exists.