**Econ 301 Bilkent University**

**Econometrics Department of Economics**

**Lab Exercise**

Using the data given in the Table, estimate the model

where *Y* = inventories and X = sales, both measured in billions of dollars.

1. Estimate the preceding regression.
2. Plot the residual terms. Do you observe any pattern?
3. From the estimated residuals find out if there is positive autocorrelation using the Durbin-Watson test.
4. Test for the negative autocorrelation.
5. If you suspect that the autoregressive error structure is of *order p,* use the Breusch-Godfrey test to verify this. How would you choose the order of *p?*
6. Gather the residual term
7. Regress the residual term on its *p* lags.
8. Calculate
9. On the basis of the results of this test, how would you transform the data to remove autocorrelation? Show all your calculations.
10. If you decide to use OLS, then get the right estimates.
11. Repeat the preceding steps using the following model:

g. How would you decide between the linear and log-linear specifications? Show explicitly the test(s) you use.

Table

Inventories and Sales in U.S. Manufacturing, 1950-1991

YEAR = Year

SALES = Sales in U.S. Manufacturing, Millions of $

INVENTORIES = Inventories in U.S. Manufacturing, Millions of $

YEAR SALES INVENTORIES

1950 38596 59822

1951 43356 70242

1952 44840 72377

1953 47987 76122

1954 46443 73175

1955 51694 79516

1956 54063 87304

1957 55879 89052

1958 54021 87055

1959 59729 92097

1960 60827 94719

1961 61159 95580

1962 65662 101049

1963 68995 105463

1964 73682 111504

1965 80283 120929

1966 87187 136824

1967 90918 145681

1968 98794 156611

1969 105812 170400

1970 108352 178594

1971 117023 188991

1972 131227 203227

1973 153881 234406

1974 178201 287144

1975 182412 288992

1976 204386 318345

1977 229786 350706

1978 260755 400929

1979 298328 452636

1980 328112 510124

1981 356909 547169

1982 348771 575486

1983 370501 591858

1984 411427 651527

1985 423940 665837

1986 431786 664654

1987 459107 711745

1988 496334 767387

1989 522344 813018

1990 540788 835985

1991 533838 828184