Econ 301	**Bilkent University**	**Berument**
Econometrics	**Department of Economics**	**Spring 2010**

Lab 1

The estimation of a demand function:

Data, reported below, is the observations on the consumption of chicken. The objective of the research is to analyze chicken demand for the US is reported for the period, 1960-1982. Economic theory indicates that the quantity demanded for a good depends on its on price, income, and the prices of alternative goods which might be substitute or complementary commodities for the good in question. Regression equation representing the demand relationship is:

$$Y_t = \beta_1 + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + u_t \qquad (1)$$

where Y_t - per capita consumption of chicken, lb.

X_{2t} - real disposable income per capita \$,

X_{3t} - real retail price of chicken per lb, cents,

X_{4t} - real retail price of pork per lb, cents,

X_{5t} - real retail price of beef per lb, cents,

a) If you estimated the following specification, then how could you interpret α_2 and α_3 estimates?

$$Y_t = \alpha_1 + \alpha_2 X_{2t} + \alpha_3 X_{3t} + u_t \qquad (2)$$

b) What is wrong with equation (2)?

c) If X_{6t} is a composite variable of price of pork and beef, constructed by weighted average, used in regression to avoid the problem of multicollinearity, how is the estimation of demand equation in the following form and its results differ from eq. (1)?

$$Y_t = \alpha_1 + \alpha_2 X_{2t} + \alpha_3 X_{3t} + \alpha_6 X_{6t} + u_t \qquad (3)$$

d) For alternative formulations of the model with different number of explanatory variables and compare the residuals and sum of squared residuals.

e) What are the R^2's of model (1) and model (3)? Which is better? Can you compare the R^2's? What is an alternative statistic that you can use?

f) Test the hypothesis that price of pork and beef has no effect on the demand of chicken.

g) What is the overall significance of equation (1)? (F-stat)

h) By considering equation 1

i. Ho $\beta_4 = 1$ against Ha: Not Ho

ii. Ho $\beta_4 = \beta_5 = 1$ against Ha: Not Ho

iii. Ho $\beta_4 = \beta_5$ against Ha: Not Ho

iv. Ho $\beta_4 = \beta_5 = 0$ against Ha: Not Ho

v. Ho $\beta_3 = -\beta_4 = -\beta_5$ against Ha: Not Ho

vi. Ho $\beta_4 = 2\ \beta_5$ against Ha: Not Ho

Obs	Y	X2	X3	X4	X5	X6
1960	27.80000	397.5000	42.20000	50.70000	78.30000	65.80000
1961	29.90000	413.3000	38.10000	52.00000	79.20000	66.90000
1962	29.80000	439.2000	40.30000	54.00000	79.20000	67.80000
1963	30.80000	459.7000	39.50000	55.30000	79.20000	69.60000
1964	31.20000	492.9000	37.30000	54.70000	77.40000	68.70000
1965	33.30000	528.6000	38.10000	63.70000	80.20000	73.60000
1966	35.60000	560.3000	39.30000	69.80000	80.40000	76.30000
1967	36.40000	624.6000	37.80000	65.90000	83.90000	77.20000
1968	36.70000	666.4000	38.40000	64.50000	85.50000	78.10000
1969	38.40000	717.8000	40.10000	70.00000	93.70000	84.70000
1970	40.40000	768.2000	38.60000	73.20000	106.1000	93.30000
1971	40.30000	843.3000	39.80000	67.80000	104.8000	89.70000
1972	41.80000	911.6000	39.70000	79.10000	114.0000	100.7000
1973	40.40000	931.1000	52.10000	95.40000	124.1000	113.5000
1974	40.70000	1021.500	48.90000	94.20000	127.6000	115.3000
1975	40.10000	1165.900	58.30000	123.5000	142.9000	136.7000
1976	42.70000	1349.600	57.90000	129.9000	143.6000	139.2000
1977	44.10000	1449.400	56.50000	117.6000	139.2000	132.0000
1978	46.70000	1575.500	63.70000	130.9000	165.5000	132.1000
1979	50.60000	1759.100	61.60000	129.8000	203.3000	154.4000
1980	50.10000	1994.200	58.90000	128.0000	219.6000	174.9000
1981	51.70000	2258.100	66.40000	141.0000	221.6000	180.8000
1982	52.90000	2478.700	70.40000	168.2000	232.6000	189.4000