



B.E. International Program

Faculty of Economics, Thammasat University



Semester: 1/2015

EE 425 Econometrics I

Homework # 2

1. A researcher obtained the following regression of expenditure on imported goods (Y) on personal disposable income (X)

$$\hat{Y}_t = -261.06 + 0.2453X_t$$

Standard error (se) = (31.327) (.....)

t statistic = (.....) (16.616)

R^2 = 0.9388; n = 20

- a) Fill in the blanks.
- b) Explain the economic meaning of 0.2453 and – 261.09
- c) Test the hypothesis that X has no influence on Y. State your significance level.
- d) Provide an interval estimation of the slope coefficient with 95% confidence level.
- e) Test whether the slope coefficient is significantly different from 0.3 at 90% confidence level.

2. Given the following data on the consumption of goods X and Y

Consumption of X	1	2	3	4	5
Consumption of Y	4	3.5	2.8	1.9	0.8

Suppose the equation of an indifference curve between X and Y is

$$X_i Y_i = \beta_1 + \beta_2 X_i$$

How would you estimate the parameters of this model? Apply the model to the above data and comment on your results.

3. *Regression without any regressor.* Suppose you are given the model: $Y_i = \beta_1 + u_i$. Use OLS to find the estimator of β_1 . What is its variance and the residual sum of squares(RSS)? Does the estimated β_1 make intuitive sense?

4. Table below gives annual data on the Consumer Price Index (CPI) and the Wholesale Price Index (WPI), also called Producer Price Index (PPI), for the U.S. economy for the period 1980-2006

Table: CPI and PPI, USA 1980-2006

	CPI Total	PPI (Total Finished Goods)
1980	82.4	88.0
1981	90.9	96.1
1982	96.5	100.0
1983	99.6	101.6
1984	103.9	103.7
1985	107.6	104.7
1986	109.6	103.2
1987	113.6	105.4
1988	118.3	108.0
1989	124.0	113.6
1990	130.7	119.2
1991	136.2	121.7
1992	140.3	123.2
1993	144.5	124.7
1994	148.2	125.5
1995	152.4	127.9
1996	156.9	131.3
1997	160.5	131.8
1998	163.0	130.7
1999	166.6	133.0
2000	172.2	138.0
2001	177.1	140.7
2002	179.9	138.9
2003	184.0	143.3
2004	188.9	148.5
2005	195.3	155.7
2006	201.6	160.3

Source: Economic Report of the President. 2007.

- a.) Plot the CPI on the vertical axis and the WPI on the horizontal axis. A priori, what kind of relationship do you expect between the two indexes? Why?
 - b.) Suppose you want to predict one of these indexes on the basis of the other index. Which will you use as the regressand (dependent variable) and which as the regressor (explanatory variable)? Why?
 - c.) Run the regression you have decided in (b). Show the standard output. Test the hypothesis that there is a one-to-one relationship between the two indexes.
5. The purchasing power parity (PPP) holds that a unit of currency should be able to buy the same bundle of goods in all countries. The proponents of the PPP argue that, in the long run, currencies tend to move toward their PPP.

Consider the following regression model by using McDonald's Big Mac as a representative bundle as given in the table.

$$Y_i = \beta_1 + \beta_2 X_i + u_i$$
 where Y = actual exchange rate
 X = implied PPP of the dollar

If the PPP theory holds, β_1 should be zero and β_2 equals 1. Test the PPP hypothesis and offer your explanation.

Table: The Big Mac Index (From The Economist, July 24, 2014)

Country	Big Mac price in local currency	Actual exchange rate	Big Mac price in dollars	Implied PPP of the dollar	Implied valuation against the dollar
United States	4.795	1.00	4.795	1.00	0.00
Argentina	21	8.17	2.57	4.38	-46.39
Australia	5.1	1.06	4.81	1.06	0.40
Brazil	13	2.22	5.86	2.71	22.11
Britain	2.89	0.59	4.93	0.60	2.71
Canada	5.64	1.07	5.25	1.18	9.51
Chile	2100	564.14	3.72	437.96	-22.37
China	16.9	6.20	2.73	3.52	-43.14
Colombia	8600	1847.65	4.65	1793.53	-2.93
Costa Rica	2150	537.30	4.00	448.38	-16.55
Czech Republic	70.45	20.39	3.46	14.69	-27.94
Denmark	28.5	5.54	5.15	5.94	7.31
Egypt	16.93	7.15	2.37	3.53	-50.62
Euro area	3.67923829	0.74	4.95	0.77	3.31
Hong Kong	18.8	7.75	2.43	3.92	-49.41
Hungary	860	228.31	3.77	179.35	-21.44
India	105	60.09	1.75	21.90	-63.56
Indonesia	27939	11505.00	2.43	5826.69	-49.36
Israel	17.5	3.41	5.13	3.65	6.91
Japan	370	101.53	3.64	77.16	-24.00
Lithuania	8.95	2.56	3.49	1.87	-27.22
Malaysia	7.63	3.17	2.41	1.59	-49.76
Mexico	42	12.93	3.25	8.76	-32.27
New Zealand	5.7	1.15	4.94	1.19	3.12
Norway	48	6.19	7.76	10.01	61.79
Pakistan	300	98.68	3.04	62.57	-36.60

Peru	10	2.79	3.59	2.09	-25.20
Philippines	160	43.21	3.70	33.37	-22.77
Poland	9.2	3.07	3.00	1.92	-37.53
Russia	89	34.84	2.55	18.56	-46.72
Saudi Arabia	11	3.75	2.93	2.29	-38.83
Singapore	4.7	1.24	3.80	0.98	-20.82
South Africa	24.5	10.51	2.33	5.11	-51.41
South Korea	4100	1023.75	4.00	855.06	-16.48
Sri Lanka	350	130.26	2.69	72.99	-43.96
Sweden	40.7	6.84	5.95	8.49	24.17
Switzerland	6.16	0.90	6.83	1.28	42.36
Taiwan	79	29.98	2.63	16.48	-45.05
Thailand	99	31.78	3.12	20.65	-35.03
Turkey	9.25	2.09	4.42	1.93	-7.75
UAE	13	3.67	3.54	2.71	-26.19
Ukraine	19	11.69	1.63	3.96	-66.09
Uruguay	113	22.97	4.92	23.57	2.60
Venezuela	75	11.00	6.82	15.64	42.19
Vietnam	60000	21230.00	2.83	12513.03	-41.06