



B.E. International Program

Faculty of Economics, Thammasat University



Semester: 1/2012

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. Consider the following formulations of the two-variable PRF:

Model I: $Y_i = \beta_1 + \beta_2 X_i + u_i$

Model II: $Y_i = \alpha_1 + \alpha_2 (X_i - \bar{X}) + u_i$

- a. Find the estimators of β_1 and α_1 . Are they identical? Are their variances identical?
- b. Find the estimators of β_2 and α_2 . Are they identical? Are their variances identical?
- c. What is the advantage, if any, of Model II over model I?

4. *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 RSS? Does the estimated β_1 make intuitive sense?
5. 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.

- 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?
- 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?
- 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.

6. 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, January 12, 2012)

Country	Big Mac prices in local currency	Big Mac prices in dollars*	Implied PPP† of the dollar	Actual dollar exchange rate January 11th 2012	Under (-)/ over (+) valuation against the dollar, %
United States‡	\$4.20	\$4.20	-	-	-
Argentina	Peso 20.0	\$4.64	4.77	4.31	10
Australia	A\$4.80	\$4.94	1.14	0.97	18
Brazil	Real 10.25	\$5.68	2.44	1.81	35
Britain	£2.49	\$3.82	1.69§	1.54	-9
Canada	C\$4.73	\$4.63	1.13	1.02	10
Chile	Peso 2,050	\$4.05	488	506	-3
China**	Yuan 15.4	\$2.44	3.67	6.32	-42
Colombia	Peso 8,400	\$4.54	2001	1852	8
Costa Rica	Colones 2,050	\$4.02	488	510	-4
Czech Republic	Koruna 70.22	\$3.45	16.73	20.4	-18
Denmark	DK 31.5	\$5.37	7.5	5.86	28
Egypt	Pound 15.5	\$2.57	3.69	6.04	-39
Euro area††	3.49	\$4.43	1.2	1.27§§	6
Hong Kong	HK\$ 16.5	\$2.12	3.93	7.77	-49
Hungary	Forint 645	\$2.63	153.67	246	-37
India***	Rupee 84.0	\$1.62	20.01	51.9	-61
Indonesia	Rupiah 22,534	\$2.46	5369	9160	-41
Israel	Shekel 15.9	\$4.13	3.79	3.85	-2
Japan	Yen 320	\$4.16	76.24	76.9	-1
Latvia	Lats 1.65	\$3.00	0.39	0.55	-29
Lithuania	Litas 7.8	\$2.87	1.86	2.72	-32
Malaysia	Ringgit 7.35	\$2.34	1.75	3.14	-44
Mexico	Peso 37	\$2.70	8.82	13.68	-36
New Zealand	NZ\$ 5.10	\$4.05	1.22	1.26	-4

Country	Big Mac prices in local currency	Big Mac prices in dollars*	Implied PPP† of the dollar	Actual dollar exchange rate January 11th 2012	Under (-)/ over (+) valuation against the dollar, %
Norway	Kroner 41	\$6.79	9.77	6.04	62
Pakistan	Rupee 260	\$2.89	61.95	90.1	-31
Peru	Sol 10.0	\$3.71	2.38	2.69	-12
Philippines	Peso 118	\$2.68	28.11	44	-36
Poland	Zloty 9.10	\$2.58	2.17	3.52	-38
Russia	Rouble 81.0	\$2.55	19.3	31.8	-39
Saudi Arabia	Riyal 10.0	\$2.67	2.38	3.75	-36
Singapore	S\$ 4.85	\$3.75	1.16	1.29	-11
South Africa	Rand 19.95	\$2.45	4.75	8.13	-42
South Korea	Won 3,700	\$3.19	882	1159	-24
Sri Lanka	Rupee 290	\$2.55	69.09	113.9	-39
Sweden	SKr 41	\$5.91	9.77	6.93	41
Switzerland	SFr 6.50	\$6.81	1.55	0.96	62
Taiwan	NT\$ 75.0	\$2.50	17.87	30	-40
Thailand	Baht 78	\$2.46	18.58	31.8	-41
Turkey	Lira 6.60	\$3.54	1.57	1.86	-16
UAE	Dirhams 12	\$3.27	2.86	3.67	-22
Ukraine	Hryvnia 17	\$2.11	4.05	8.04	-50
Uruguay	Peso 90	\$4.63	21.44	19.45	10