HW#2

Exercise 2 OLS

- The correlation between Y and X1:

	y	x1
y	**1.0000**	
x1	**0.1984**	**1.0000**

- The coefficients on this regression

y	Coef.
x1	**1.202823**
x2	**-.9015529**
x3	**.0492988**
_cons	**2.522753**

- The standard errors
  - Standard formulas of the OLS

y	Coef.	Std. Err.
x1	**1.202823**	**.0171948**
x2	**-.9015529**	**.0028733**
x3	**.0492988**	**.0217605**
_cons	**2.522753**	**.0402986**

  - Bootstrap(r=49)

y	Observed Coef.	Bootstrap Std. Err.
x1	**1.202823**	**.0168363**
x2	**-.9015529**	**.0031226**
x3	**.0492988**	**.0249356**
_cons	**2.522753**	**.0388285**

- Bootstrap(r=499)

y	Observed Coef.	Bootstrap Std. Err.
x1	1.202823	.0170046
x2	-.9015529	.0028584
x3	.0492988	.0220892
_cons	2.522753	.0385021

Exercise 4&5 Discrete Choice

- Probit

ydum	Coef.
x1	1.163635
x2	-.9199552
x3	-.0514779
_cons	3.202179

Marginal effect and delta-method standard error

	dy/dx	Delta-method Std. Err.
x1	.4642085	.0176004
x2	-.3669972	.0075313
x3	-.0205361	.0189407

- Logit

ydum	Coef.
x1	2.114757
x2	-1.657532
x3	-.0915463
_cons	5.736495

Marginal effect and delta-method standard error

	dy/dx	Delta-method Std. Err.
x1	.5286741	.0206636
x2	-.4143713	.0094613
x3	-.0228859	.0214063

HW#3

Exercise 1 OLS Data Description

- average and dispersion in product characteristics

Variable	Obs	Mean	Std. Dev.	Min	Max
ppk_stk	4,470	.5184362	.1505174	.19	.67
pbb_stk	4,470	.5432103	.1203319	.19	1.01
pfl_stk	4,470	1.01502	.0428952	.95	1.16
phse_stk	4,470	.4371476	.1188312	.19	.64
pgen_stk	4,470	.3452819	.0351661	.25	.55
pimp_stk	4,470	.7807785	.1146461	.33	2.3
pss_tub	4,470	.8250895	.0612116	.5	.98
ppk_tub	4,470	1.077409	.0297261	.98	1.24
pfl_tub	4,470	1.189376	.0140545	.69	1.47
phse_tub	4,470	.5686734	.072455	.33	1.27

- market share

choice	Freq.	Percent	Cum.
1	1,766	39.51	39.51
2	699	15.64	55.15
3	243	5.44	60.58
4	593	13.27	73.85
5	315	7.05	80.89
6	74	1.66	82.55
7	319	7.14	89.69
8	203	4.54	94.23
9	225	5.03	99.26
10	33	0.74	100.00
Total	4,470	100.00	

Income	choice 1	2	3	4	5	6	Total
2.5	19	4	0	2	6	0	50
7.5	117	54	13	34	19	2	295
12.5	196	106	41	44	23	9	495
17.5	318	100	27	111	21	5	677
22.5	292	123	34	154	123	2	843
27.5	195	94	9	67	18	6	476
32.5	209	84	28	64	54	4	549
37.5	132	34	17	29	23	1	279
42.5	125	33	33	23	6	20	303
47.5	83	22	23	16	7	17	188
55	47	30	11	32	7	3	201
67.5	19	4	1	8	6	2	51
87.5	9	10	3	1	0	1	37
130	5	1	3	8	2	2	26
Total	1,766	699	243	593	315	74	4,470

Income	choice 7	8	9	10	Total
2.5	16	1	2	0	50
7.5	27	6	22	1	295
12.5	40	8	25	3	495
17.5	54	19	20	2	677
22.5	41	36	30	8	843
27.5	24	25	34	4	476
32.5	49	19	33	5	549
37.5	15	14	9	5	279
42.5	27	21	14	1	303
47.5	6	9	2	3	188
55	12	42	17	0	201
67.5	7	3	0	1	51
87.5	1	0	12	0	37
130	0	0	5	0	26
Total	319	203	225	33	4,470

Exercise 2&3&4&5

- **Conditional logit**
  - Coefficients

dum	Coef.	Std. Err.
price		
c	**-6.656579**	**.1742793**
1	(base alternative)	
2		
_cons	**-.9543068**	**.0500462**
3		
_cons	**1.296968**	**.1086515**
4		
_cons	**-1.717332**	**.0541582**
5		
_cons	**-2.904005**	**.0714605**
6		
_cons	**-1.515311**	**.1262303**
7		
_cons	**.2517684**	**.079164**
8		
_cons	**1.464868**	**.1180467**
9		
_cons	**2.357505**	**.133774**
10		
_cons	**-3.896594**	**.177419**

- Marginal Effects

Pr(choice = 1|1 selected)

variable	dp/dx
c	
1	**-1.62007**
2	**.38092**
3	**.156526**
4	**.359811**
5	**.202435**
6	**.04471**
7	**.194866**
8	**.12222**
9	**.14162**
10	**.016959**

Pr(choice = 2|1 selected)

variable	dp/dx
c	
1	**.38092**
2	**-.785545**
3	**.051111**
4	**.117491**
5	**.066102**
6	**.014599**
7	**.063631**
8	**.039909**
9	**.046244**
10	**.005538**

Pr(choice = 3|1 selected)

variable	dp/dx
c	
1	**.156526**
2	**.051111**
3	**-.352903**
4	**.048279**
5	**.027162**
6	**.005999**
7	**.026147**
8	**.016399**
9	**.019002**
10	**.002276**

Pr(choice = 4|1 selected)

variable	dp/dx
c	
1	**.359811**
2	**.117491**
3	**.048279**
4	**−.748524**
5	**.062439**
6	**.01379**
7	**.060104**
8	**.037698**
9	**.043681**
10	**.005231**

Pr(choice = 5|1 selected)

variable	dp/dx
c	
1	**.202435**
2	**.066102**
3	**.027162**
4	**.062439**
5	**−.44844**
6	**.007759**
7	**.033816**
8	**.021209**
9	**.024576**
10	**.002943**

Pr(choice = 6|1 selected)

variable	dp/dx
c	
1	**.04471**
2	**.014599**
3	**.005999**
4	**.01379**
5	**.007759**
6	**−.105088**
7	**.007469**
8	**.004684**
9	**.005428**
10	**.00065**

Pr(choice = 7|1 selected)

variable	dp/dx
c	
1	**.194866**
2	**.063631**
3	**.026147**
4	**.060104**
5	**.033816**
6	**.007469**
7	**−.432938**
8	**.020416**
9	**.023657**
10	**.002833**

Pr(choice = 8|1 selected)

variable	dp/dx
c	
1	**.12222**
2	**.039909**
3	**.016399**
4	**.037698**
5	**.021209**
6	**.004684**
7	**.020416**
8	**−.279151**
9	**.014838**
10	**.001777**

Pr(choice = 9|1 selected)

variable	dp/dx
c	
1	**.14162**
2	**.046244**
3	**.019002**
4	**.043681**
5	**.024576**
6	**.005428**
7	**.023657**
8	**.014838**
9	**−.321105**
10	**.002059**

Pr(choice = 10|1 selected)

variable	dp/dx
c	
1	**.016959**
2	**.005538**
3	**.002276**
4	**.005231**
5	**.002943**
6	**.00065**
7	**.002833**
8	**.001777**
9	**.002059**
10	**−.040265**

- **Multinomial logit**
  - Coefficients

dum	Coef.	Std. Err.
1	(base alternative)	
2		
income	-.0030887	.003114
_cons	-.8453241	.0931354
3		
income	.0145862	.0038255
_cons	-2.399858	.1335802
4		
income	.0040504	.0030926
_cons	-1.201326	.0971021
5		
income	-.0012536	.0042024
_cons	-1.690582	.1269952
6		
income	.030612	.004674
_cons	-4.139767	.210989
7		
income	-.0069326	.0044161
_cons	-1.531042	.1280434
8		
income	.0228862	.0036217
_cons	-2.848352	.1393848
9		
income	.017743	.0037623
_cons	-2.575597	.13614
10		
income	.0107909	.01013
_cons	-4.28227	.345792

  - Marginal Effects

Pr(choice = 1|1 selected)

variable	dp/dx
casevars	
income	**-.001062**

Pr(choice = 2|1 selected)

variable	dp/dx
casevars	
income	**-.000904**

Pr(choice = 3|1 selected)

variable	dp/dx
casevars	
income	**.000644**

Pr(choice = 4|1 selected)

variable	dp/dx
casevars	
income	**.000185**

Pr(choice = 5|1 selected)

variable	dp/dx
casevars	
income	**-.000278**

Pr(choice = 6|1 selected)

variable	dp/dx
casevars	
income	**.000413**

Pr(choice = 7|1 selected) =

variable	dp/dx	S
casevars		
income	**-.000682**	

Pr(choice = 8|1 selected) =

variable	dp/dx	S
casevars		
income	**.000878**	

Pr(choice = 9|1 selected) =

variable	dp/dx	S
casevars		
income	**.000746**	

Pr(choice = 10|1 selected)

variable	dp/dx	S
casevars		
income	**.00006**	

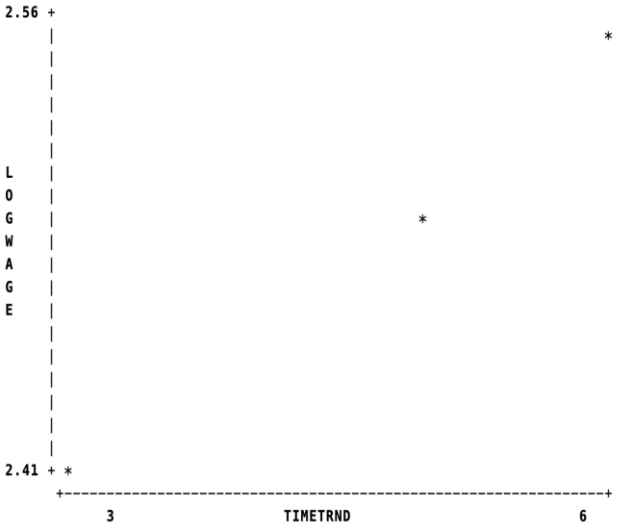
- **IIA test**

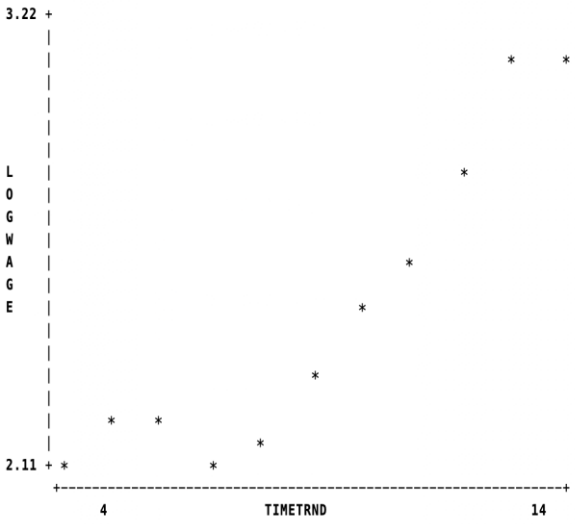
```
Test:  Ho:  difference in coefficients not systematic

             chi2(18) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =        5.59
            Prob>chi2 =      0.9976
            (V_b-V_B is not positive definite)
```

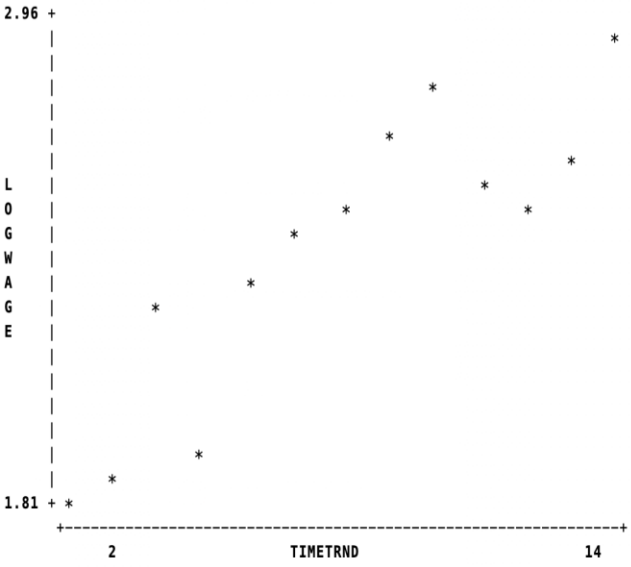
The outputs of two models are the same.

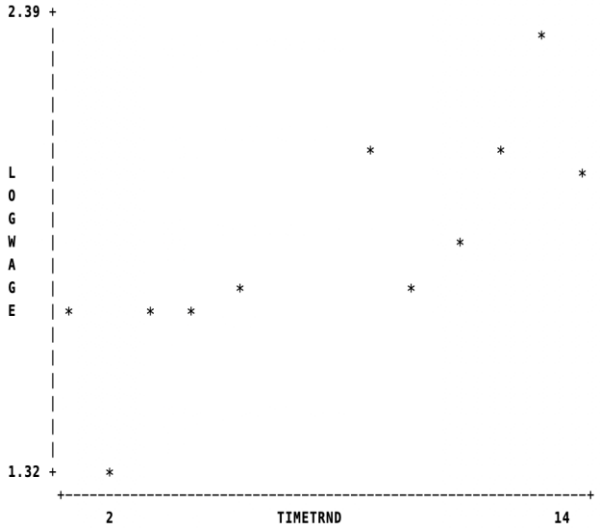
HW#2

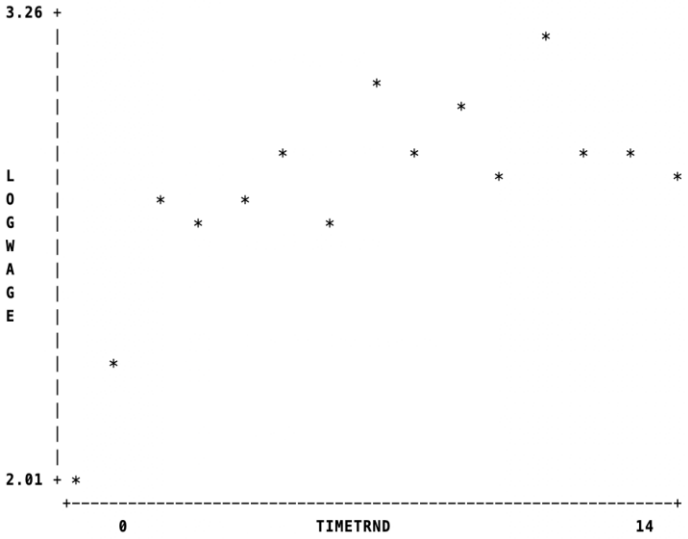
Exercise 1 randomly choose 5 individuals


2.56
2.41
LOGWAGE
3
TIMETRND
6


3.22
2.11
LOGWAGE
4
TIMETRND
14


2.96
1.81
LOGWAGE
2
TIMETRND
14


2.39
1.32
LOGWAGE
2
TIMETRND
14


3.26
2.01
LOGWAGE
0
TIMETRND
14

Exercise 2 random effect model

logwage	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
educ	.107938	.0033832	31.90	0.000	.1013071	.114569
potexper	.0387645	.0007178	54.00	0.000	.0373576	.0401714
_cons	.5635206	.0438846	12.84	0.000	.4775083	.6495328
sigma_u	.37207276					
sigma_e	.33545728					
rho	.5516129	(fraction of variance due to u_i)				

Exercise 3 fixed effect model

- **between estimator**

logwage	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
educ	.0930999	.0046685	19.94	0.000	.0839447	.1022551
potexper	.0259987	.0036049	7.21	0.000	.0189294	.0330681
_cons	.8455688	.0770179	10.98	0.000	.6945324	.9966052

- **within estimator**

logwage	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
educ	.123662	.0057619	21.46	0.000	.1123681	.1349559
potexper	.0385611	.0007585	50.84	0.000	.0370744	.0400478
_cons	.4068016	.0717348	5.67	0.000	.2661931	.54741
sigma_u	.40290853					
sigma_e	.33545728					
rho	.59059603	(fraction of variance due to u_i)				

- **first time difference estimator**

d_wage	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
d_edu	.0383523	.0081414	4.71	0.000	.0223942	.0543104
d_exp	.0039891	.0038866	1.03	0.305	-.0036291	.0116072
_cons	.0494644	.005536	8.94	0.000	.0386132	.0603155