



14.2

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Notes:

1. You are running Small Stata.
2. Unicode is supported; see [help unicode advice](#).
3. New update available; type [-update all-](#)

```
1 . do "/Users/dailondolojan/Desktop/Econ 113/H4 Q4.do"
2 . use "/Users/dailondolojan/desktop/stata_data/ceo_salary", clear
3 .
4 . *Question 4*
5 . *PART A*
6 . reg salary sales roe ros indus finance consprod
```

Source	SS	df	MS	Number of obs	=	209
Model	31762665.5	6	5293777.58	F(6, 202)	=	2.97
Residual	359970317	202	1782031.27	Prob > F	=	0.0084
				R-squared	=	0.0811
				Adj R-squared	=	0.0538
Total	391732982	208	1883331.64	Root MSE	=	1334.9

salary	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sales	.0111722	.0090017	1.24	0.216	-.0065773	.0289216
roe	7.970479	12.62133	0.63	0.528	-16.91598	32.85694
ros	-2.142566	1.492172	-1.44	0.153	-5.084797	.7996658
indus	279.7675	291.5297	0.96	0.338	-295.0642	854.5992
finance	552.465	300.598	1.84	0.068	-40.24739	1145.177
consprod	948.1143	322.5469	2.94	0.004	312.1236	1584.105
_cons	715.7507	276.0282	2.59	0.010	171.4845	1260.017

```

7 .
8 . *The regression equation is as follows:*
9 . *salary = 715.751+0.011sales+7.970roe-2.143ros+279.768indus+552.465finance+
10 . *      +948.114consprod*
11 . *For every 1 unit increase in firm sales there will be an 0.11 unit increase in*
12 . *in salary*
13 .
14 . *PART B*
15 . *Consprod is stastically significant at the 95% level.*
16 .
17 . *PART C*
18 . test _b[roe]=10

```

```
( 1)  roe = 10
```

```

      F( 1, 202) =    0.03
      Prob > F =    0.8724

```

```

19 . *With this test, we receive an F-statistic of 0.03 with a corresponding p-value*
20 . *of 0.8724. Therefore we cannot reject the null hypothesis of the coefficient*
21 . *being equal to 10*
22 .
23 . *PART D*
24 . reg salary sales roe ros

```

Source	SS	df	MS	Number of obs	=	209
Model	12501859.4	3	4167286.46	F(3, 205)	=	2.25
Residual	379231123	205	1849907.92	Prob > F	=	0.0834
				R-squared	=	0.0319
				Adj R-squared	=	0.0177
Total	391732982	208	1883331.64	Root MSE	=	1360.1

salary	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sales	.0154825	.0089539	1.73	0.085	-.0021711	.0331361
roe	22.00331	11.51655	1.91	0.057	-.7027663	44.70939
ros	-1.105191	1.45024	-0.76	0.447	-3.96449	1.754108
_cons	864.1175	228.3997	3.78	0.000	413.8038	1314.431

```
25 . reg salary sales roe ros indus finance consprod
```

Source	SS	df	MS	Number of obs	=	209
Model	31762665.5	6	5293777.58	F(6, 202)	=	2.97
Residual	359970317	202	1782031.27	Prob > F	=	0.0084
				R-squared	=	0.0811
				Adj R-squared	=	0.0538
Total	391732982	208	1883331.64	Root MSE	=	1334.9

salary	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sales	.0111722	.0090017	1.24	0.216	-.0065773	.0289216
roe	7.970479	12.62133	0.63	0.528	-16.91598	32.85694
ros	-2.142566	1.492172	-1.44	0.153	-5.084797	.7996658
indus	279.7675	291.5297	0.96	0.338	-295.0642	854.5992
finance	552.465	300.598	1.84	0.068	-40.24739	1145.177
consprod	948.1143	322.5469	2.94	0.004	312.1236	1584.105
_cons	715.7507	276.0282	2.59	0.010	171.4845	1260.017

26 . test (indus=0) (finance=0) (consprod=0)

(1) **indus = 0**
 (2) **finance = 0**
 (3) **consprod = 0**

F(3, 202) = 3.60
 Prob > F = 0.0144

27 .
 end of do-file

28 . do "/Users/dailondolojan/Desktop/Econ 113/H4 Q5.do"

29 . use "/Users/dailondolojan/desktop/stata_data/ceo_salary", clear

30 .
 31 . *Question 5*
 32 . *PART A*
 33 . sum sales, detail

1990 firm sales, millions \$

Percentiles		Smallest		
1%	298.7	175.2		
5%	764.7	181.5		
10%	1212.3	298.7	Obs	209
25%	2210.3	514.1	Sum of Wgt.	209
			Mean	6923.793
50%	3705.2		Std. Dev.	10633.27
75%	7177	44323	Variance	1.13e+08
90%	14932.1	57662	Skewness	4.999125
95%	20659	69018	Kurtosis	35.29968
99%	57662	97649.9		

```
34 . drop if sales >= r(p95) | sales <= r(p5)
    (22 observations deleted)
```

```
35 . reg salary sales roe ros indus finance consprod
```

Source	SS	df	MS	Number of obs	=	187
Model	32405554.9	6	5400925.82	F(6, 180)	=	2.80
Residual	346981390	180	1927674.39	Prob > F	=	0.0125
				R-squared	=	0.0854
				Adj R-squared	=	0.0549
Total	379386945	186	2039714.76	Root MSE	=	1388.4

salary	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sales	.0319599	.0248212	1.29	0.200	-.0170181	.080938
roe	2.974402	14.07285	0.21	0.833	-24.79459	30.74339
ros	-1.31981	2.051491	-0.64	0.521	-5.367875	2.728255
indus	293.8079	318.7044	0.92	0.358	-335.0693	922.6852
finance	533.244	317.2829	1.68	0.095	-92.82843	1159.316
consprod	1046.035	351.2056	2.98	0.003	353.0249	1739.044
_cons	650.0858	315.7541	2.06	0.041	27.03	1273.142

```
36 .
37 . *The coefficients and statistical significance of the variables barely change*
38 . *The only differences noted would have to be the coefficients and standard*
39 . * of sales is larger and roe is smaller which does not influence the*
40 . * significance*
41 .
42 . *PART B*
43 . sum sales, detail
```

1990 firm sales, millions \$

Percentiles		Smallest		
1%	834.4	785.3		
5%	1212.3	834.4		
10%	1509.1	962.8	Obs	187
25%	2388.7	976.7	Sum of Wgt.	187
50%	3705.2		Mean	5255.026
		Largest	Std. Dev.	4254.442
75%	6703.1	18908		
90%	11232	19020.5	Variance	1.81e+07
95%	14932.1	19773	Skewness	1.650183
99%	19773	20604	Kurtosis	5.424882

```
44 . replace sales = r(p95) if sales >= r(p95)
```

(9 real changes made)

```
45 . replace sales = r(p5) if sales <= r(p5)
    (9 real changes made)
```

```
46 . reg salary sales roe ros indus finance consprod
```

Source	SS	df	MS	Number of obs	=	187
Model	32584543.2	6	5430757.2	F(6, 180)	=	2.82
Residual	346802401	180	1926680.01	Prob > F	=	0.0120
				R-squared	=	0.0859
				Adj R-squared	=	0.0554
Total	379386945	186	2039714.76	Root MSE	=	1388

salary	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sales	.0371104	.0280394	1.32	0.187	-.0182178	.0924386
roe	3.051731	14.07051	0.22	0.829	-24.71263	30.81609
ros	-1.325006	2.049724	-0.65	0.519	-5.369584	2.719572
indus	291.8103	318.6204	0.92	0.361	-336.9012	920.5218
finance	529.7132	317.4122	1.67	0.097	-96.6143	1156.041
consprod	1041.252	351.4569	2.96	0.003	347.7464	1734.757
_cons	630.392	320.4281	1.97	0.051	-1.886595	1262.671

```
47 .
48 . *The roe coefficient increases and is not significant with the other variables*
49 . *changing a little bit.*
50 .
51 . *PART C*
52 . gen ln_sal = ln(salary)

53 . reg ln_sal sales roe ros indus finance consprod
```

Source	SS	df	MS	Number of obs	=	187
Model	15.3992161	6	2.56653601	F(6, 180)	=	11.64
Residual	39.6831835	180	.22046213	Prob > F	=	0.0000
				R-squared	=	0.2796
				Adj R-squared	=	0.2556
Total	55.0823995	186	.296141933	Root MSE	=	.46953

ln_sal	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sales	.0000422	9.48e-06	4.45	0.000	.0000235	.0000609
roe	.006424	.0047596	1.35	0.179	-.0029678	.0158158
ros	.0002538	.0006934	0.37	0.715	-.0011144	.001622
indus	.3350798	.1077794	3.11	0.002	.1224062	.5477535

finance	.452714	.1073707	4.22	0.000	.2408468	.6645812
consprod	.5471078	.118887	4.60	0.000	.3125164	.7816992
_cons	6.268034	.1083909	57.83	0.000	6.054153	6.481914

```

54 .
55 . *The coefficients have all decreased and are now statistically significant at*
56 . *a 95% CI level with the R^2 term being increased as well.*
57 .
    end of do-file

```

```

58 . do "/Users/dailondolojan/Desktop/Econ 113/H4 Q6.do"

```

```

59 . use "/Users/dailondolojan/desktop/stata_data/wages", clear

```

```

60 .
61 . *Question 6*
62 . *PART A*
63 . reg wage IQ

```

Source	SS	df	MS	Number of obs	=	901
Model	557036.315	1	557036.315	F(1, 899)	=	93.38
Residual	5362814.38	899	5965.31077	Prob > F	=	0.0000
Total	5919850.7	900	6577.61189	R-squared	=	0.0941
				Adj R-squared	=	0.0931
				Root MSE	=	77.235

wage	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
IQ	1.651079	.1708609	9.66	0.000	1.315747	1.986412
_cons	1024.364	17.46236	58.66	0.000	990.0925	1058.636

```

64 .
65 . *The Regression Equation is as follows:*
66 . *wage = 1024.364 + 1.651IQ*
67 . *Fore every 1 unit increase in IQ, wage will increase by 1.651 units*
68 .
69 . *PART B*
70 . gen noisel = rnormal(0,50)
71 . gen IQwithnoisel = IQ + noisel
72 . reg wage IQwithnoisel

```

Source	SS	df	MS	Number of obs	=	901
Model	119820.169	1	119820.169	F(1, 899)	=	18.57
				Prob > F	=	0.0000

Residual	5800030.53	899	6451.64686	R-squared	=	0.0202
Total	5919850.7	900	6577.61189	Adj R-squared	=	0.0192
				Root MSE	=	80.322

wage	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
IQwithnoise1	.2215835	.0514171	4.31	0.000	.120672	.3224951
_cons	1169.331	5.750461	203.35	0.000	1158.045	1180.617

```

73 .
74 . *wage = 1176.654 + 0.145IQ*
75 .
76 . gen noise2 = rnormal(0,50)

77 . gen IQwithnoise2 = IQ + noise2

78 . reg wage IQwithnoise2

```

Source	SS	df	MS	Number of obs	=	901
Model	74614.2238	1	74614.2238	F(1, 899)	=	11.48
Residual	5845236.47	899	6501.93156	Prob > F	=	0.0007
Total	5919850.7	900	6577.61189	R-squared	=	0.0126
				Adj R-squared	=	0.0115
				Root MSE	=	80.635

wage	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
IQwithnoise2	.1797297	.0530555	3.39	0.001	.0756027	.2838567
_cons	1172.848	6.064311	193.40	0.000	1160.946	1184.75

```

79 .
80 . *wage = 1184.749 + 0.066IQ*
81 .
82 . gen noise3 = rnormal(0,50)

83 . gen IQwithnoise3 = IQ + noise3

84 . reg wage IQwithnoise3

```

Source	SS	df	MS	Number of obs	=	901
Model	27806.6237	1	27806.6237	F(1, 899)	=	4.24
Residual	5892044.07	899	6553.99786	Prob > F	=	0.0397
Total	5919850.7	900	6577.61189	R-squared	=	0.0047
				Adj R-squared	=	0.0036
				Root MSE	=	80.957

wage	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
IQwithnoise3	.10697	.0519327	2.06	0.040	.0050465	.2088936
_cons	1180.507	5.878585	200.81	0.000	1168.97	1192.044

```

85 .
86 . *wage = 1170.719 + 0.205IQ*
87 .
88 . gen noise4 = rnormal(0,50)

89 . gen IQwithnoise4 = IQ + noise4

90 . reg wage IQwithnoise4

```

Source	SS	df	MS	Number of obs	=	901
Model	72511.9105	1	72511.9105	F(1, 899)	=	11.15
Residual	5847338.79	899	6504.27006	Prob > F	=	0.0009
				R-squared	=	0.0122
				Adj R-squared	=	0.0112
Total	5919850.7	900	6577.61189	Root MSE	=	80.649

wage	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
IQwithnoise4	.1792105	.0536733	3.34	0.001	.073871	.28455
_cons	1173.533	5.951986	197.17	0.000	1161.852	1185.214

```

91 .
92 . *wage = 1182.512 + 0.087IQ*
93 .
94 . gen noise5 = rnormal(0,50)

95 . gen IQwithnoise5 = IQ + noise5

96 . reg wage IQwithnoise5

```

Source	SS	df	MS	Number of obs	=	901
Model	39902.5227	1	39902.5227	F(1, 899)	=	6.10
Residual	5879948.17	899	6540.54302	Prob > F	=	0.0137
				R-squared	=	0.0067
				Adj R-squared	=	0.0056
Total	5919850.7	900	6577.61189	Root MSE	=	80.874

wage	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
------	-------	-----------	---	------	----------------------	--

IQwithnoise5	.1256178	.0508578	2.47	0.014	.0258039	.2254316
_cons	1178.488	5.832789	202.05	0.000	1167.041	1189.936

```

97 .
98 . *wage = 1182.528 + 0.089IQ*
99 .
100 . *PART C*
101 . sum IQ

```

Variable	Obs	Mean	Std. Dev.	Min	Max
IQ	901	101.0866	15.06789	50	145

```

102 . correlate wage IQ, covariance
    (obs=901)

```

	wage	IQ
wage	6577.61	
IQ	374.863	227.041

```

103 .
104 . *The coefficients are smaller in PART B because of the random noises that were*
105 . *added on.*
106 .
107 . *PART D*
108 . *We are observing attenuation bias where every addion of noise, the coefficent
109 . *is attenuated by a multiple of 12.*
110 .
    end of do-file
111 .

```