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name: <unnamed>
log: /Users/mien/Desktop/ee426/assignment11.log
log type: text
opened on: 20 Apr 2021, 09:21:01

. histogram y1
(bin=17, start=103.46626, width=55.638129)

Y1 is truncated

. graph save Graph "/Users/mien/Desktop/ee426/assignment11_1_1.gph"
(file /Users/mien/Desktop/ee426/assignment11_1_1.gph saved)

. histogram y2
(bin=20, start=0, width=52.465723)

Y2 is censored data

. graph save Graph "/Users/mien/Desktop/ee426/assignment11_1_2.gph"
(file /Users/mien/Desktop/ee426/assignment11_1_2.gph saved)

. histogram y3
(bin=20, start=-866.33484, width=5018.7203)

Y3 has outliers

. graph save Graph "/Users/mien/Desktop/ee426/assignment11_1_3.gph"
(file /Users/mien/Desktop/ee426/assignment11_1_3.gph saved)

. summarize y1

```

Variable	Obs	Mean	Std. Dev.	Min
Max				

+				
y1	297	423.1683	227.8976	103.4663
1049.314				

```

. predict y1_hat
(option xb assumed; fitted values)

. est store m_y1hat

. truncreg y1 x, ll(100) nolog
(note: 0 obs. truncated)

Truncated regression
Limit: lower = 100 Number of obs =
297
upper = +inf Wald chi2(1) =
23.70

```

Log likelihood = -1975.456 Prob > chi2 = 0.0000

	y1	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
	x	243.9104	50.10515	4.87	0.000	145.7061
	_cons	-431.5919	172.0405	-2.51	0.012	-768.7851
	/sigma	302.9879	25.65687	11.81	0.000	252.7013

. predict truncated, e(0,.)

. est store m_y1trunc

. reg y1 x

	Source	SS	df	MS	Number of obs	=
	Model	1431905.59	1	1431905.59	F(1, 295)	=
	Residual	13941534.7	295	47259.4396	Prob > F	=
	Total	15373440.3	296	51937.2982	R-squared	=
					Adj R-squared	=
					Root MSE	=

	y1	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
	x	123.1693	22.37637	5.50	0.000	79.13176
	_cons	69.01677	65.56422	1.05	0.293	-60.01611

. est store m_y1hat

```
. lrtest m_y1hat m_y1trunc, force
```

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Likelihood-ratio test                                LR chi2(1)  =
86.66
(Assumption: m_y1hat nested in m_y1trunc)          Prob > chi2 =
0.0000

```

LRtest reject H0 so we should use truncated model

```
. reg y2 x
```

Source	SS	df	MS	Number of obs	=
400					
-----+-----					F(1, 398)
76.58					
Model	4567087.34	1	4567087.34	Prob > F	=
0.0000					
Residual	23737174.2	398	59641.1413	R-squared	=
0.1614					
-----+-----					Adj R-squared
0.1592					
Total	28304261.6	399	70937.9989	Root MSE	=
244.22					

	y2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
-----+-----						
x		179.8325	20.55046	8.75	0.000	139.4315
220.2335						
_cons		-179.3679	58.08821	-3.09	0.002	-293.566
-65.1698						

```
. est store m_y2hat
```

```
. predict y2_hat
(option xb assumed; fitted values)
```

```
. tobit y2 x, ll(0)
```

```

Tobit regression                                Number of obs    =
400
                                                LR chi2(1)      =
73.17
                                                Prob > chi2     =
0.0000
Log likelihood = -2389.3077                    Pseudo R2       =
0.0151

```

	y2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]

+-----						
	x	219.1562	24.86468	8.81	0.000	170.2741
268.0383						
	_cons	-318.6265	70.93087	-4.49	0.000	-458.0714
-179.1816						

+-----						
	/sigma	284.9073	11.56717			262.1671
307.6475						

72 left-censored observations at y2 <= 0
328 uncensored observations
0 right-censored observations

. predict censored, ystar(0,.)

. est store m_y2censored

. lrtest m_y2hat m_y2censored

test involves different estimators: tobit vs. regress
r(498);

. lrtest m_y2hat m_y2censored, force

Likelihood-ratio test

LR chi2(1) =

752.97

(Assumption: m_y2hat nested in m_y2censored)

Prob > chi2 =

0.0000

LRTest rejects H0 so we should use Tobit

. reg y3 x

	Source	SS	df	MS	Number of obs	=
400						

					F(1, 398)	=
26.43						
	Model	1.3359e+10	1	1.3359e+10	Prob > F	=
0.0000						
	Residual	2.0115e+11	398	505402183	R-squared	=
0.0623						

					Adj R-squared	=
0.0599						
	Total	2.1451e+11	399	537616802	Root MSE	=
22481						

	y3	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
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Interval]

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+-----
      x |   9726.042   1891.765    5.14   0.000    6006.941
13445.14
      _cons |  -16431.39   5347.288   -3.07   0.002   -26943.85
-5918.932
-----
```

```
. est store m_y3hat
```

```
. predict y3_hat
(option xb assumed; fitted values)
```

```
. tobit y3 x, ul(2000)
```

```
Tobit regression                                Number of obs    =
400                                              LR chi2(1)       =
52.03                                           Prob > chi2      =
0.0000                                          Pseudo R2       =
Log likelihood = -2693.1735
0.0096
```

```
-----
-----
      y3 |      Coef.   Std. Err.      t    P>|t|     [95% Conf.
Interval]
-----+-----
      x |   581.8005   79.00741     7.36   0.000    426.4777
737.1233
      _cons |  -961.6042  221.4967    -4.34   0.000   -1397.051
-526.1579
-----
+-----
      /sigma |   911.3804   39.08073                834.5505
988.2103
-----
```

```
-----
      0 left-censored observations
     315 uncensored observations
      85 right-censored observations at y3 >= 2000
```

```
. predict y3censored
(option xb assumed; fitted values)
```

```
. est store m_y3censored
```

```
. lrtest m_y3hat m_y3censored, force
```

```
Likelihood-ratio test                                LR chi2(1) =
```

3763.14

(Assumption: m_{y3hat} nested in $m_{y3censored}$)
0.0000

Prob > chi2 =

LRtest rejects H_0 so we should use Tobit