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 Serial number: 10699393  
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Notes:

1. Unicode is supported; see [help unicode advice](#).
2. More than 2 billion observations are allowed; see [help obs advice](#).
3. Maximum number of variables is set to 5000; see [help set maxvar](#).

1 . log using "C:\Users\com\Downloads\assign 13.smcl"

```
name: <unnamed>
log: C:\Users\com\Downloads\assign 13.smcl
log type: smcl
opened on: 29 Apr 2021, 02:34:51
```

2 . use "C:\Users\com\Downloads\assign\_timeseries.dta", clear

3 . dfuller spot, trend lags(1) regress

Augmented Dickey-Fuller test for unit root                      Number of obs    =            793

Test Statistic	Interpolated Dickey-Fuller			
	1% Critical Value	5% Critical Value	10% Critical Value	
Z(t)	-1.339	-3.960	-3.410	-3.120

MacKinnon approximate p-value for Z(t) = 0.8780

D.spot	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
spot						
L1.	-0.0042396	0.0031666	-1.34	0.181	-0.0104556	0.0019764
LD.	0.0832853	0.035481	2.35	0.019	0.013637	0.1529337
_trend	-0.000739	0.0014208	-0.52	0.603	-0.0035281	0.00205
_cons	2.253569	1.884627	1.20	0.232	-1.445907	5.953046

4 . dfuller spot, lags(1) regress

Augmented Dickey-Fuller test for unit root                      Number of obs    =            793

Test Statistic	Interpolated Dickey-Fuller			
	1% Critical Value	5% Critical Value	10% Critical Value	
Z(t)	-1.238	-3.430	-2.860	-2.570

MacKinnon approximate p-value for Z(t) = 0.6570

9

D.spot	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
spot						
L1.	<b>-0.0034926</b>	<b>.002821</b>	<b>-1.24</b>	<b>0.216</b>	<b>-0.0090301</b>	<b>.0020448</b>
LD.	<b>.0828543</b>	<b>.035455</b>	<b>2.34</b>	<b>0.020</b>	<b>.0132572</b>	<b>.1524514</b>
_cons	<b>1.597051</b>	<b>1.39888</b>	<b>1.14</b>	<b>0.254</b>	<b>-1.14891</b>	<b>4.343012</b>

5 . dfuller spot, nocon lags(1) regress

Augmented Dickey-Fuller test for unit root                      Number of obs =                      **793**

Test Statistic	Interpolated Dickey-Fuller		
	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	<b>-0.585</b>	<b>-2.580</b>	<b>-1.950</b>

D.spot	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
spot						
L1.	<b>-0.003419</b>	<b>.0005845</b>	<b>-0.58</b>	<b>0.559</b>	<b>-0.0014892</b>	<b>.0008054</b>
LD.	<b>.0811979</b>	<b>.0354321</b>	<b>2.29</b>	<b>0.022</b>	<b>.011646</b>	<b>.1507499</b>

6 . dfuller future, trend lags(1) regress

*Test statistic < Critical value, we have unit root  
: non-stationary*

Augmented Dickey-Fuller test for unit root                      Number of obs =                      **793**

Test Statistic	Interpolated Dickey-Fuller		
	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	<b>-1.374</b>	<b>-3.960</b>	<b>-3.410</b>

MacKinnon approximate p-value for Z(t) = **0.8685**

D.future	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
future						
L1.	<b>-0.0050243</b>	<b>.0036579</b>	<b>-1.37</b>	<b>0.170</b>	<b>-0.0122046</b>	<b>.002156</b>
LD.	<b>-0.0335608</b>	<b>.0355846</b>	<b>-0.94</b>	<b>0.346</b>	<b>-0.1034125</b>	<b>.036291</b>
_trend	<b>-0.0009128</b>	<b>.0016705</b>	<b>-0.55</b>	<b>0.585</b>	<b>-0.0041919</b>	<b>.0023663</b>
_cons	<b>2.67398</b>	<b>2.183399</b>	<b>1.22</b>	<b>0.221</b>	<b>-1.611978</b>	<b>6.959937</b>

7 . dfuller future, lags(1) regress

Augmented Dickey-Fuller test for unit root                      Number of obs =                      **793**

Test Statistic	Interpolated Dickey-Fuller		
	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	<b>-1.264</b>	<b>-3.430</b>	<b>-2.860</b>

MacKinnon approximate p-value for Z(t) = **0.6453**

D.future	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
future						
L1.	<b>-0.0041054</b>	<b>.0032469</b>	<b>-1.26</b>	<b>0.206</b>	<b>-0.0104789</b>	<b>.0022682</b>
LD.	<b>-0.0340903</b>	<b>.0355556</b>	<b>-0.96</b>	<b>0.338</b>	<b>-0.103885</b>	<b>.0357044</b>
_cons	<b>1.866323</b>	<b>1.606292</b>	<b>1.16</b>	<b>0.246</b>	<b>-1.286783</b>	<b>5.019429</b>

8 . dfuller future, nocon lags(1) regress

Augmented Dickey-Fuller test for unit root                      Number of obs =                      **793**

Test Statistic	Interpolated Dickey-Fuller		
	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	<b>-0.609</b>	<b>-2.580</b>	<b>-1.950</b>

D.future	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
future						
L1.	<b>-0.0004181</b>	<b>.0006863</b>	<b>-0.61</b>	<b>0.543</b>	<b>-0.0017653</b>	<b>.0009291</b>
LD.	<b>-0.0360006</b>	<b>.0355254</b>	<b>-1.01</b>	<b>0.311</b>	<b>-0.1057359</b>	<b>.0337347</b>

2

9 . gen rspot = spot-l.spot  
(1 missing value generated)

*Test statistic < critical value, we have unit root  
: non-stationary*

10 . gen rfuture = future - l.future  
(1 missing value generated)

11 . replace rspot = rspot/spot  
(793 real changes made)

12 . replace rfuture = rfuture/future  
(792 real changes made)

13 . dfuller rspot, trend lags(1) regress

Augmented Dickey-Fuller test for unit root                      Number of obs =                      **792**

Test Statistic	Interpolated Dickey-Fuller		
	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	<b>-17.551</b>	<b>-3.960</b>	<b>-3.410</b>

MacKinnon approximate p-value for Z(t) = **0.0000**

D.rspot	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
rspot						
L1.	<b>-0.8498297</b>	<b>.0484217</b>	<b>-17.55</b>	<b>0.000</b>	<b>-0.9448804</b>	<b>-0.754779</b>
LD.	<b>-0.0868715</b>	<b>.0354939</b>	<b>-2.45</b>	<b>0.015</b>	<b>-0.1565453</b>	<b>-0.0171976</b>
_trend	<b>3.77e-07</b>	<b>2.92e-06</b>	<b>0.13</b>	<b>0.897</b>	<b>-5.36e-06</b>	<b>6.11e-06</b>
_cons	<b>-0.0004939</b>	<b>.0013394</b>	<b>-0.37</b>	<b>0.712</b>	<b>-0.0031231</b>	<b>.0021353</b>

*Test statistics > critical value  
H0 rejected, no unit root: stationary*

14 . dfuller rfuture, trend lags(1) regress

Augmented Dickey-Fuller test for unit root                      Number of obs    =            792

Test Statistic	Interpolated Dickey-Fuller		
	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-19.435	-3.960	-3.410

MacKinnon approximate p-value for Z(t) = 0.0000

D.rfuture	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
rfuture						
L1.	-.9983341	.0513682	-19.43	0.000	-1.099169	-.8974994
LD.	-.0409981	.035614	-1.15	0.250	-.1109077	.0289115
_trend	1.76e-07	3.44e-06	0.05	0.959	-6.58e-06	6.93e-06
_cons	-.0005515	.0015772	-0.35	0.727	-.0036475	.0025446

15 .

*Test statistic > critical value  
H<sub>0</sub> rejected, no unit root: stationary*