

Step 1: testing for a unit root in AGILENTClose

Augmented Dickey-Fuller test for AGILENTClose  
 including 5 lags of (1-L)AGILENTClose  
 sample size 840  
 unit-root null hypothesis:  $a = 1$

test with constant  
 model:  $(1-L)y = b_0 + (a-1)*y(-1) + \dots + e$   
 estimated value of  $(a - 1)$ : -0.00204107  
 test statistic:  $\tau_c(1) = -0.621046$   
 asymptotic p-value 0.8637  
 1st-order autocorrelation coeff. for e: 0.001  
 lagged differences:  $F(5, 833) = 1.788 [0.1127]$

Augmented Dickey-Fuller regression  
 OLS, using observations 2006-01-11:2009-05-13 (T = 840)  
 Dependent variable: d\_AGILENTClose

	coefficient	std. error	t-ratio	p-value	
const	0.0431703	0.106189	0.4065	0.6844	
AGILENTClose_1	-0.00204107	0.00328650	-0.6210	0.8637	
d_AGILENTClose_1	-0.0630817	0.0347568	-1.815	0.0699	*
d_AGILENTClose_2	-0.0579711	0.0348263	-1.665	0.0964	*
d_AGILENTClose_3	0.0518273	0.0348491	1.487	0.1373	
d_AGILENTClose_4	-0.00189897	0.0348053	-0.05456	0.9565	
d_AGILENTClose_5	0.0243237	0.0347351	0.7003	0.4840	

AIC: 1679.64    BIC: 1712.77    HQC: 1692.34

Step 2: testing for a unit root in ANALOGClose

Augmented Dickey-Fuller test for ANALOGClose  
 including 5 lags of (1-L)ANALOGClose  
 sample size 840  
 unit-root null hypothesis:  $a = 1$

test with constant  
 model:  $(1-L)y = b_0 + (a-1)*y(-1) + \dots + e$   
 estimated value of  $(a - 1)$ : -0.00420644  
 test statistic:  $\tau_c(1) = -1.07482$   
 asymptotic p-value 0.728  
 1st-order autocorrelation coeff. for e: -0.000  
 lagged differences:  $F(5, 833) = 3.081 [0.0092]$

Augmented Dickey-Fuller regression

OLS, using observations 2006-01-11:2009-05-13 (T = 840)  
 Dependent variable: d\_ANALOGClose

	coefficient	std. error	t-ratio	p-value	
const	0.101829	0.117459	0.8669	0.3862	
ANALOGClose_1	-0.00420644	0.00391363	-1.075	0.7280	
d_ANALOGClose_1	-0.0973218	0.0347158	-2.803	0.0052	***
d_ANALOGClose_2	-0.0929501	0.0348619	-2.666	0.0078	***
d_ANALOGClose_3	0.0187883	0.0350023	0.5368	0.5916	
d_ANALOGClose_4	-0.00124241	0.0348181	-0.03568	0.9715	
d_ANALOGClose_5	-0.0243309	0.0346853	-0.7015	0.4832	

AIC: 1590.42    BIC: 1623.55    HQC: 1603.12

Step 3: cointegrating regression

Cointegrating regression -  
 OLS, using observations 2006-01-03:2009-05-13 (T = 846)  
 Dependent variable: AGILENTClose

	coefficient	std. error	t-ratio	p-value	
const	-1.56010	0.584379	-2.670	0.0077	***
ANALOGClose	1.12144	0.0194831	57.56	1.88e-294	***

Mean dependent var	31.50057	S.D. dependent var	6.947032
Sum squared resid	8279.531	S.E. of regression	3.132071
R-squared	0.796975	Adjusted R-squared	0.796734
Log-likelihood	-2165.294	Akaike criterion	4334.589
Schwarz criterion	4344.070	Hannan-Quinn	4338.221
rho	0.975583	Durbin-Watson	0.048859

Step 4: testing for a unit root in uhat

Augmented Dickey-Fuller test for uhat  
 including 5 lags of (1-L)uhat  
 sample size 840  
 unit-root null hypothesis: a = 1

test without constant  
 model:  $(1-L)y = (a-1)*y(-1) + \dots + e$   
 estimated value of (a - 1): -0.0268004  
 test statistic:  $\tau_c(2) = -3.42147$   
 asymptotic p-value 0.04007  
 1st-order autocorrelation coeff. for e: -0.001  
 lagged differences:  $F(5, 834) = 2.558 [0.0262]$

Augmented Dickey-Fuller regression

OLS, using observations 2006-01-11:2009-05-13 (T = 840)

Dependent variable: d\_uhat

	coefficient	std. error	t-ratio	p-value	
uhat_1	-0.0268004	0.00783302	-3.421	0.0401	**
d_uhat_1	-0.0231756	0.0344504	-0.6727	0.5013	
d_uhat_2	0.0662387	0.0344514	1.923	0.0549	*
d_uhat_3	0.0808020	0.0344856	2.343	0.0194	**
d_uhat_4	0.0302309	0.0346916	0.8714	0.3838	
d_uhat_5	-0.0630172	0.0346980	-1.816	0.0697	*

AIC: 1756.97    BIC: 1785.37    HQC: 1767.86

There is evidence for a cointegrating relationship if:

- (a) The unit-root hypothesis is not rejected for the individual variables, and
- (b) the unit-root hypothesis is rejected for the residuals (uhat) from the cointegrating regression.