



ภาคผนวก

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ภาคผนวก ก

การทดสอบความนิ่งของข้อมูล (Unit Root test)

1. วิธี Augmented Dickey-Fuller (ADF) Test

ราคาทองคำในตลาดปัจจุบัน

ที่ Order of integration = 0 หรือ I(0)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: GS has a unit root

Exogenous: None

Lag Length: 0 (Automatic based on SIC, MAXLAG=21)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	1.146982	0.9355
Test critical values:		
1% level	-2.567183	
5% level	-1.941127	
10% level	-1.616495	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GS)

Method: Least Squares

Date: 05/22/10 Time: 15:31

Sample (adjusted): 2 1043

Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GS(-1)	0.000527	0.000459	1.146982	0.2517
R-squared	-0.000535	Mean dependent var		0.518282
Adjusted R-squared	-0.000535	S.D. dependent var		12.22306
S.E. of regression	12.22633	Akaike info criterion		7.846021
Sum squared resid	155612.1	Schwarz criterion		7.850770
Log likelihood	-4086.777	Hannan-Quinn criter.		7.847822
Durbin-Watson stat	1.993285			

- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: GS has a unit root  
Exogenous: Constant  
Lag Length: 0 (Automatic based on SIC, MAXLAG=21)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.990195	0.7585
Test critical values:		
1% level	-3.436407	
5% level	-2.864103	
10% level	-2.568186	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(GS)  
Method: Least Squares  
Date: 05/22/10 Time: 15:32  
Sample (adjusted): 2 1043  
Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GS(-1)	-0.002312	0.002335	-0.990195	0.3223
C	2.387748	1.925575	1.240018	0.2152
R-squared	0.000942	Mean dependent var		0.518282
Adjusted R-squared	-0.000019	S.D. dependent var		12.22306
S.E. of regression	12.22318	Akaike info criterion		7.846463
Sum squared resid	155382.3	Schwarz criterion		7.855962
Log likelihood	-4086.007	Hannan-Quinn criter.		7.850066
F-statistic	0.980487	Durbin-Watson stat		1.990573
Prob(F-statistic)	0.322309			

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- กรณีมีทั้งค่าคงที่และแนวโน้มเวลา

Null Hypothesis: GS has a unit root  
Exogenous: Constant, Linear Trend  
Lag Length: 0 (Automatic based on SIC, MAXLAG=21)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.013353	0.1289
Test critical values:		
1% level	-3.966879	
5% level	-3.414131	
10% level	-3.129170	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(GS)  
Method: Least Squares  
Date: 05/22/10 Time: 15:33  
Sample (adjusted): 2 1043  
Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GS(-1)	-0.017479	0.005801	-3.013353	0.0026
C	9.995790	3.284224	3.043578	0.0024
@TREND(1)	0.008927	0.003127	2.854524	0.0044
R-squared	0.008716	Mean dependent var		0.518282
Adjusted R-squared	0.006808	S.D. dependent var		12.22306
S.E. of regression	12.18139	Akaike info criterion		7.840570
Sum squared resid	154173.3	Schwarz criterion		7.854819
Log likelihood	-4081.937	Hannan-Quinn criter.		7.845975
F-statistic	4.567767	Durbin-Watson stat		1.975989
Prob(F-statistic)	0.010590			

ที่ Order of integration = 1 หรือ I(1)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: D(GS) has a unit root  
Exogenous: None  
Lag Length: 0 (Automatic based on SIC, MAXLAG=21)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-32.08370	0.0000
Test critical values:		
1% level	-2.567185	
5% level	-1.941128	
10% level	-1.616495	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(GS,2)  
Method: Least Squares  
Date: 05/22/10 Time: 15:35  
Sample (adjusted): 3 1043  
Included observations: 1041 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GS(-1))	-0.994906	0.031010	-32.08370	0.0000
R-squared	0.497430	Mean dependent var		0.003458
Adjusted R-squared	0.497430	S.D. dependent var		17.26535
S.E. of regression	12.23978	Akaike info criterion		7.848220
Sum squared resid	155804.7	Schwarz criterion		7.852973
Log likelihood	-4083.998	Hannan-Quinn criter.		7.850022
Durbin-Watson stat	2.000001			

- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: D(GS) has a unit root  
Exogenous: Constant  
Lag Length: 0 (Automatic based on SIC, MAXLAG=21)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-32.12576	0.0000
Test critical values:		
1% level	-3.436413	
5% level	-2.864106	
10% level	-2.568188	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(GS,2)  
Method: Least Squares  
Date: 05/22/10 Time: 15:37  
Sample (adjusted): 3 1043  
Included observations: 1041 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GS(-1))	-0.996686	0.031024	-32.12576	0.0000
C	0.516881	0.379538	1.361868	0.1735
R-squared	0.498326	Mean dependent var		0.003458
Adjusted R-squared	0.497843	S.D. dependent var		17.26535
S.E. of regression	12.23475	Akaike info criterion		7.848357
Sum squared resid	155527.0	Schwarz criterion		7.857863
Log likelihood	-4083.070	Hannan-Quinn criter.		7.851963
F-statistic	1032.065	Durbin-Watson stat		1.999976
Prob(F-statistic)	0.000000			

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- กรณีมีทั้งค่าคงที่และแนวโน้มของเวลา

Null Hypothesis: D(GS) has a unit root  
Exogenous: Constant, Linear Trend  
Lag Length: 0 (Automatic based on SIC, MAXLAG=21)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-32.11197	0.0000
Test critical values:		
1% level	-3.966888	
5% level	-3.414136	
10% level	-3.129172	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(GS,2)  
Method: Least Squares  
Date: 05/22/10 Time: 15:38  
Sample (adjusted): 3 1043  
Included observations: 1041 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GS(-1))	-0.996735	0.031039	-32.11197	0.0000
C	0.363942	0.760476	0.478571	0.6323
@TREND(1)	0.000293	0.001262	0.232114	0.8165
R-squared	0.498352	Mean dependent var		0.003458
Adjusted R-squared	0.497385	S.D. dependent var		17.26535
S.E. of regression	12.24033	Akaike info criterion		7.850227
Sum squared resid	155519.0	Schwarz criterion		7.864486
Log likelihood	-4083.043	Hannan-Quinn criter.		7.855636
F-statistic	515.5893	Durbin-Watson stat		1.999980
Prob(F-statistic)	0.000000			

### ราคาน้ำมันในตลาดปัจจุบัน

ที่ Order of integration = 0 หรือ I(0)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: OS has a unit root  
Exogenous: None  
Lag Length: 0 (Automatic based on SIC, MAXLAG=21)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.117911	0.6429
Test critical values:		
1% level	-2.567183	
5% level	-1.941127	
10% level	-1.616495	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(OS)  
Method: Least Squares  
Date: 05/22/10 Time: 15:39  
Sample (adjusted): 2 1043  
Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OS(-1)	-8.11E-05	0.000687	-0.117911	0.9062
R-squared	-0.000058	Mean dependent var		0.014520
Adjusted R-squared	-0.000058	S.D. dependent var		1.724921
S.E. of regression	1.724971	Akaike info criterion		3.929257
Sum squared resid	3097.521	Schwarz criterion		3.934006
Log likelihood	-2046.143	Hannan-Quinn criter.		3.931058
Durbin-Watson stat	1.865063			



- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: OS has a unit root  
Exogenous: Constant  
Lag Length: 0 (Automatic based on SIC, MAXLAG=21)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.350712	0.6075
Test critical values:		
1% level	-3.436407	
5% level	-2.864103	
10% level	-2.568186	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(OS)  
Method: Least Squares  
Date: 05/22/10 Time: 15:40  
Sample (adjusted): 2 1043  
Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OS(-1)	-0.003309	0.002450	-1.350712	0.1771
C	0.261401	0.190423	1.372736	0.1701
R-squared	0.001751	Mean dependent var		0.014520
Adjusted R-squared	0.000791	S.D. dependent var		1.724921
S.E. of regression	1.724239	Akaike info criterion		3.929366
Sum squared resid	3091.919	Schwarz criterion		3.938865
Log likelihood	-2045.200	Hannan-Quinn criter.		3.932969
F-statistic	1.824424	Durbin-Watson stat		1.862424
Prob(F-statistic)	0.177081			

- กรณีมีทั้งค่าคงที่และแนวโน้มของเวลา

Null Hypothesis: OS has a unit root  
Exogenous: Constant, Linear Trend  
Lag Length: 0 (Automatic based on SIC, MAXLAG=21)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.334233	0.8787
Test critical values:		
1% level	-3.966879	
5% level	-3.414131	
10% level	-3.129170	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(OS)  
Method: Least Squares  
Date: 05/22/10 Time: 15:41  
Sample (adjusted): 2 1043  
Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OS(-1)	-0.003274	0.002454	-1.334233	0.1824
C	0.287464	0.208290	1.380113	0.1678
@TREND(1)	-5.50E-05	0.000178	-0.309480	0.7570
R-squared	0.001843	Mean dependent var		0.014520
Adjusted R-squared	-0.000078	S.D. dependent var		1.724921
S.E. of regression	1.724989	Akaike info criterion		3.931193
Sum squared resid	3091.634	Schwarz criterion		3.945441
Log likelihood	-2045.152	Hannan-Quinn criter.		3.936598
F-statistic	0.959308	Durbin-Watson stat		1.862661
Prob(F-statistic)	0.383497			

ที่ Order of integration = 1 หรือ I(1)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: D(OS) has a unit root  
Exogenous: None  
Lag Length: 0 (Automatic based on SIC, MAXLAG=21)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-30.16089	0.0000
Test critical values:		
1% level	-2.567185	
5% level	-1.941128	
10% level	-1.616495	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(OS,2)  
Method: Least Squares  
Date: 05/22/10 Time: 15:42  
Sample (adjusted): 3 1043  
Included observations: 1041 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OS(-1))	-0.933426	0.030948	-30.16089	0.0000
R-squared	0.466579	Mean dependent var		0.000480
Adjusted R-squared	0.466579	S.D. dependent var		2.356974
S.E. of regression	1.721432	Akaike info criterion		3.925151
Sum squared resid	3081.862	Schwarz criterion		3.929904
Log likelihood	-2042.041	Hannan-Quinn criter.		3.926953
Durbin-Watson stat	1.994852			

- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: D(OS) has a unit root  
Exogenous: Constant  
Lag Length: 0 (Automatic based on SIC, MAXLAG=21)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-30.14805	0.0000
Test critical values:		
1% level	-3.436413	
5% level	-2.864106	
10% level	-2.568188	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(OS,2)  
Method: Least Squares  
Date: 05/22/10 Time: 15:43  
Sample (adjusted): 3 1043  
Included observations: 1041 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OS(-1))	-0.933479	0.030963	-30.14805	0.0000
C	0.012335	0.053379	0.231079	0.8173
R-squared	0.466606	Mean dependent var		0.000480
Adjusted R-squared	0.466093	S.D. dependent var		2.356974
S.E. of regression	1.722216	Akaike info criterion		3.927020
Sum squared resid	3081.704	Schwarz criterion		3.936526
Log likelihood	-2042.014	Hannan-Quinn criter.		3.930626
F-statistic	908.9047	Durbin-Watson stat		1.994852
Prob(F-statistic)	0.000000			

- กรณีมีทั้งค่าคงที่และแนวโน้มของเวลา

Null Hypothesis: D(OS) has a unit root  
Exogenous: Constant, Linear Trend  
Lag Length: 0 (Automatic based on SIC, MAXLAG=21)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-30.13617	0.0000
Test critical values:		
1% level	-3.966888	
5% level	-3.414136	
10% level	-3.129172	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(OS,2)  
Method: Least Squares  
Date: 05/22/10 Time: 15:43  
Sample (adjusted): 3 1043  
Included observations: 1041 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OS(-1))	-0.933604	0.030979	-30.13617	0.0000
C	0.040242	0.107046	0.375928	0.7070
@TREND(1)	-5.35E-05	0.000178	-0.300804	0.7636
R-squared	0.466653	Mean dependent var		0.000480
Adjusted R-squared	0.465625	S.D. dependent var		2.356974
S.E. of regression	1.722970	Akaike info criterion		3.928854
Sum squared resid	3081.435	Schwarz criterion		3.943114
Log likelihood	-2041.969	Hannan-Quinn criter.		3.934263
F-statistic	454.0998	Durbin-Watson stat		1.994785
Prob(F-statistic)	0.000000			

### ราคาทองคำในตลาดซื้อขายล่วงหน้า

ที่ Order of integration = 0 หรือ I(0)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: GF has a unit root  
Exogenous: None  
Lag Length: 0 (Automatic based on SIC, MAXLAG=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	0.695124	0.8644
Test critical values:		
1% level	-2.584214	
5% level	-1.943494	
10% level	-1.614970	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(GF)  
Method: Least Squares  
Date: 05/24/10 Time: 14:48  
Sample (adjusted): 2 122  
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GF(-1)	0.000785	0.001129	0.695124	0.4883
R-squared	-0.000799	Mean dependent var		0.961157
Adjusted R-squared	-0.000799	S.D. dependent var		13.88934
S.E. of regression	13.89489	Akaike info criterion		8.109150
Sum squared resid	23168.16	Schwarz criterion		8.132255
Log likelihood	-489.6036	Hannan-Quinn criter.		8.118534
Durbin-Watson stat	2.231766			

- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: GF has a unit root  
Exogenous: Constant  
Lag Length: 0 (Automatic based on SIC, MAXLAG=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.988008	0.2918
Test critical values:		
1% level	-3.485115	
5% level	-2.885450	
10% level	-2.579598	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(GF)  
Method: Least Squares  
Date: 05/24/10 Time: 14:50  
Sample (adjusted): 2 122  
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GF(-1)	-0.066562	0.033482	-1.988008	0.0491
C	75.40529	37.46737	2.012559	0.0464
R-squared	0.032144	Mean dependent var		0.961157
Adjusted R-squared	0.024011	S.D. dependent var		13.88934
S.E. of regression	13.72158	Akaike info criterion		8.092208
Sum squared resid	22405.54	Schwarz criterion		8.138420
Log likelihood	-487.5786	Hannan-Quinn criter.		8.110976
F-statistic	3.952176	Durbin-Watson stat		2.157373
Prob(F-statistic)	0.049107			

- กรณีมีทั้งค่าคงที่และแนวโน้มเวลา

Null Hypothesis: GF has a unit root  
Exogenous: Constant, Linear Trend  
Lag Length: 0 (Automatic based on SIC, MAXLAG=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.188962	0.4910
Test critical values:		
1% level	-4.035648	
5% level	-3.447383	
10% level	-3.148761	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(GF)  
Method: Least Squares  
Date: 05/24/10 Time: 14:50  
Sample (adjusted): 2 122  
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GF(-1)	-0.079587	0.036358	-2.188962	0.0306
C	87.79078	39.82399	2.204470	0.0294
@TREND(1)	0.035764	0.038782	0.922187	0.3583
R-squared	0.039069	Mean dependent var		0.961157
Adjusted R-squared	0.022783	S.D. dependent var		13.88934
S.E. of regression	13.73022	Akaike info criterion		8.101556
Sum squared resid	22245.22	Schwarz criterion		8.170873
Log likelihood	-487.1441	Hannan-Quinn criter.		8.129708
F-statistic	2.398819	Durbin-Watson stat		2.144670
Prob(F-statistic)	0.095242			

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ที่ Order of integration = 1 หรือ I(1)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: D(GF) has a unit root  
Exogenous: None  
Lag Length: 0 (Automatic based on SIC, MAXLAG=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-12.19735	0.0000
Test critical values:		
1% level	-2.584375	
5% level	-1.943516	
10% level	-1.614956	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(GF,2)  
Method: Least Squares  
Date: 05/24/10 Time: 14:51  
Sample (adjusted): 3 122  
Included observations: 120 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GF(-1))	-1.113820	0.091317	-12.19735	0.0000
R-squared	0.555591	Mean dependent var		0.082500
Adjusted R-squared	0.555591	S.D. dependent var		20.83642
S.E. of regression	13.89040	Akaike info criterion		8.108572
Sum squared resid	22960.25	Schwarz criterion		8.131801
Log likelihood	-485.5143	Hannan-Quinn criter.		8.118005
Durbin-Watson stat	2.007853			

- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: D(GF) has a unit root  
Exogenous: Constant  
Lag Length: 0 (Automatic based on SIC, MAXLAG=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-12.21034	0.0000
Test critical values:		
1% level	-3.485586	
5% level	-2.885654	
10% level	-2.579708	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(GF,2)  
Method: Least Squares  
Date: 05/24/10 Time: 14:52  
Sample (adjusted): 3 122  
Included observations: 120 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GF(-1))	-1.118654	0.091615	-12.21034	0.0000
C	1.063187	1.272162	0.835732	0.4050
R-squared	0.558206	Mean dependent var		0.082500
Adjusted R-squared	0.554461	S.D. dependent var		20.83642
S.E. of regression	13.90804	Akaike info criterion		8.119337
Sum squared resid	22825.15	Schwarz criterion		8.165795
Log likelihood	-485.1602	Hannan-Quinn criter.		8.138204
F-statistic	149.0925	Durbin-Watson stat		2.011014
Prob(F-statistic)	0.000000			

- กรณีมีทั้งค่าคงที่และแนวโน้มของเวลา

Null Hypothesis: D(GF) has a unit root  
Exogenous: Constant, Linear Trend  
Lag Length: 0 (Automatic based on SIC, MAXLAG=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-12.15845	0.0000
Test critical values:		
1% level	-4.036310	
5% level	-3.447699	
10% level	-3.148946	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(GF,2)  
Method: Least Squares  
Date: 05/24/10 Time: 14:52  
Sample (adjusted): 3 122  
Included observations: 120 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GF(-1))	-1.118630	0.092004	-12.15845	0.0000
C	0.891514	2.599552	0.342949	0.7323
@TREND(1)	0.002791	0.036808	0.075828	0.9397
R-squared	0.558227	Mean dependent var		0.082500
Adjusted R-squared	0.550676	S.D. dependent var		20.83642
S.E. of regression	13.96700	Akaike info criterion		8.135954
Sum squared resid	22824.03	Schwarz criterion		8.205642
Log likelihood	-485.1573	Hannan-Quinn criter.		8.164255
F-statistic	73.92102	Durbin-Watson stat		2.011151
Prob(F-statistic)	0.000000			

### ราคาน้ำมันในตลาดซื้อขายล่วงหน้า

ที่ Order of integration = 0 หรือ I(0)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: OF has a unit root  
Exogenous: None  
Lag Length: 0 (Automatic based on SIC, MAXLAG=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	0.911175	0.9025
Test critical values:		
1% level	-2.584214	
5% level	-1.943494	
10% level	-1.614970	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(OF)  
Method: Least Squares  
Date: 05/24/10 Time: 14:52  
Sample (adjusted): 2 122  
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OF(-1)	0.001453	0.001595	0.911175	0.3640
R-squared	-0.001271	Mean dependent var		0.124298
Adjusted R-squared	-0.001271	S.D. dependent var		1.378452
S.E. of regression	1.379328	Akaike info criterion		3.489300
Sum squared resid	228.3054	Schwarz criterion		3.512405
Log likelihood	-210.1026	Hannan-Quinn criter.		3.498684
Durbin-Watson stat	2.141648			

- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: OF has a unit root  
Exogenous: Constant  
Lag Length: 0 (Automatic based on SIC, MAXLAG=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.537059	0.5116
Test critical values:		
1% level	-3.485115	
5% level	-2.885450	
10% level	-2.579598	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(OF)  
Method: Least Squares  
Date: 05/24/10 Time: 14:53  
Sample (adjusted): 2 122  
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OF(-1)	-0.047236	0.030731	-1.537059	0.1269
C	3.833525	2.416413	1.586453	0.1153
R-squared	0.019467	Mean dependent var		0.124298
Adjusted R-squared	0.011227	S.D. dependent var		1.378452
S.E. of regression	1.370692	Akaike info criterion		3.484899
Sum squared resid	223.5768	Schwarz criterion		3.531111
Log likelihood	-208.8364	Hannan-Quinn criter.		3.503668
F-statistic	2.362550	Durbin-Watson stat		2.082864
Prob(F-statistic)	0.126934			

- กรณีมีทั้งค่าคงที่แนวโน้มของเวลา

Null Hypothesis: OF has a unit root  
Exogenous: Constant, Linear Trend  
Lag Length: 0 (Automatic based on SIC, MAXLAG=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.170280	0.5014
Test critical values:		
1% level	-4.035648	
5% level	-3.447383	
10% level	-3.148761	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(OF)  
Method: Least Squares  
Date: 05/24/10 Time: 14:53  
Sample (adjusted): 2 122  
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OF(-1)	-0.083092	0.038286	-2.170280	0.0320
C	6.227888	2.853954	2.182196	0.0311
@TREND(1)	0.006906	0.004445	1.553804	0.1229
R-squared	0.039127	Mean dependent var		0.124298
Adjusted R-squared	0.022841	S.D. dependent var		1.378452
S.E. of regression	1.362619	Akaike info criterion		3.481175
Sum squared resid	219.0941	Schwarz criterion		3.550492
Log likelihood	-207.6111	Hannan-Quinn criter.		3.509327
F-statistic	2.402467	Durbin-Watson stat		2.050401
Prob(F-statistic)	0.094909			

ที่ Order of integration = 1 หรือ I(1)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: D(OF) has a unit root  
Exogenous: None  
Lag Length: 0 (Automatic based on SIC, MAXLAG=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-11.63228	0.0000
Test critical values:		
1% level	-2.584375	
5% level	-1.943516	
10% level	-1.614956	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(OF,2)  
Method: Least Squares  
Date: 05/24/10 Time: 14:54  
Sample (adjusted): 3 122  
Included observations: 120 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OF(-1))	-1.063702	0.091444	-11.63228	0.0000
R-squared	0.532067	Mean dependent var		-0.001333
Adjusted R-squared	0.532067	S.D. dependent var		2.025550
S.E. of regression	1.385590	Akaike info criterion		3.498428
Sum squared resid	228.4633	Schwarz criterion		3.521657
Log likelihood	-208.9057	Hannan-Quinn criter.		3.507861
Durbin-Watson stat	2.000519			

- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: D(OF) has a unit root  
Exogenous: Constant  
Lag Length: 0 (Automatic based on SIC, MAXLAG=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-11.67694	0.0000
Test critical values:		
1% level	-3.485586	
5% level	-2.885654	
10% level	-2.579708	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(OF,2)  
Method: Least Squares  
Date: 05/24/10 Time: 14:54  
Sample (adjusted): 3 122  
Included observations: 120 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OF(-1))	-1.071797	0.091787	-11.67694	0.0000
C	0.128175	0.126962	1.009561	0.3148
R-squared	0.536074	Mean dependent var		-0.001333
Adjusted R-squared	0.532143	S.D. dependent var		2.025550
S.E. of regression	1.385478	Akaike info criterion		3.506494
Sum squared resid	226.5069	Schwarz criterion		3.552952
Log likelihood	-208.3896	Hannan-Quinn criter.		3.525361
F-statistic	136.3510	Durbin-Watson stat		2.001787
Prob(F-statistic)	0.000000			



- กรณีมีทั้งค่าคงที่และแนวโน้มของเวลา

Null Hypothesis: D(OF) has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 0 (Automatic based on SIC, MAXLAG=12)

	t-Statistic
Augmented Dickey-Fuller test statistic	-11.64091
Test critical values:	
1% level	-4.036310
5% level	-3.447699
10% level	-3.148946

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(OF,2)  
 Method: Least Squares  
 Date: 05/24/10 Time: 14:54  
 Sample (adjusted): 3 122  
 Included observations: 120 after adjustments

Variable	Coefficient	Std. Error	t-Statistic
D(OF(-1))	-1.072651	0.092145	-11.64091
C	0.040325	0.258712	0.155870
@TREND(1)	0.001430	0.003665	0.390171

  

R-squared	0.536677	Mean dependent var
Adjusted R-squared	0.528757	S.D. dependent var
S.E. of regression	1.390482	Akaike info criterion
Sum squared resid	226.2126	Schwarz criterion
Log likelihood	-208.3116	Hannan-Quinn criter.
F-statistic	67.76180	Durbin-Watson stat
Prob(F-statistic)	0.000000	

## 2. วิธี Phillip-Perron (PP) Test

ราคาทองคำในตลาดปัจจุบัน

ที่ Order of integration = 0 หรือ I(0)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: GS has a unit root  
Exogenous: None  
Bandwidth: 5 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	1.140947	0.9348
Test critical values:		
1% level	-2.567183	
5% level	-1.941127	
10% level	-1.616495	
*MacKinnon (1996) one-sided p-values.		
Residual variance (no correction)		149.3398
HAC corrected variance (Bartlett kernel)		150.4545

Phillips-Perron Test Equation  
Dependent Variable: D(GS)  
Method: Least Squares  
Date: 05/22/10 Time: 16:00  
Sample (adjusted): 2 1043  
Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GS(-1)	0.000527	0.000459	1.146982	0.2517
R-squared	-0.000535	Mean dependent var		0.518282
Adjusted R-squared	-0.000535	S.D. dependent var		12.22306
S.E. of regression	12.22633	Akaike info criterion		7.846021
Sum squared resid	155612.1	Schwarz criterion		7.850770
Log likelihood	-4086.777	Hannan-Quinn criter.		7.847822
Durbin-Watson stat	1.993285			

- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: GS has a unit root  
Exogenous: Constant  
Bandwidth: 4 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-0.989348	0.7588
Test critical values:		
1% level	-3.436407	
5% level	-2.864103	
10% level	-2.568186	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	149.1193
HAC corrected variance (Bartlett kernel)	148.9441

Phillips-Perron Test Equation  
Dependent Variable: D(GS)  
Method: Least Squares  
Date: 05/22/10 Time: 16:01  
Sample (adjusted): 2 1043  
Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GS(-1)	-0.002312	0.002335	-0.990195	0.3223
C	2.387748	1.925575	1.240018	0.2152

R-squared	0.000942	Mean dependent var	0.518282
Adjusted R-squared	-0.000019	S.D. dependent var	12.22306
S.E. of regression	12.22318	Akaike info criterion	7.846463
Sum squared resid	155382.3	Schwarz criterion	7.855962
Log likelihood	-4086.007	Hannan-Quinn criter.	7.850066
F-statistic	0.980487	Durbin-Watson stat	1.990573
Prob(F-statistic)	0.322309		

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- กรณีมีทั้งค่าคงที่และแนวโน้มของเวลา

Null Hypothesis: GS has a unit root  
Exogenous: Constant, Linear Trend  
Bandwidth: 1 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-3.031371	0.1241
Test critical values:		
1% level	-3.966879	
5% level	-3.414131	
10% level	-3.129170	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	147.9590
HAC corrected variance (Bartlett kernel)	149.7285

Phillips-Perron Test Equation  
Dependent Variable: D(GS)  
Method: Least Squares  
Date: 05/22/10 Time: 16:04  
Sample (adjusted): 2 1043  
Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GS(-1)	-0.017479	0.005801	-3.013353	0.0026
C	9.995790	3.284224	3.043578	0.0024
@TREND(1)	0.008927	0.003127	2.854524	0.0044
R-squared	0.008716	Mean dependent var		0.518282
Adjusted R-squared	0.006808	S.D. dependent var		12.22306
S.E. of regression	12.18139	Akaike info criterion		7.840570
Sum squared resid	154173.3	Schwarz criterion		7.854819
Log likelihood	-4081.937	Hannan-Quinn criter.		7.845975
F-statistic	4.567767	Durbin-Watson stat		1.975989
Prob(F-statistic)	0.010590			

ที่ Order of integration = 1 หรือ I(1)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: D(GS) has a unit root  
Exogenous: None  
Bandwidth: 4 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-32.08324	0.0000
Test critical values:		
1% level	-2.567185	
5% level	-1.941128	
10% level	-1.616495	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	149.6683
HAC corrected variance (Bartlett kernel)	148.5343

Phillips-Perron Test Equation  
Dependent Variable: D(GS,2)  
Method: Least Squares  
Date: 05/22/10 Time: 16:08  
Sample (adjusted): 3 1043  
Included observations: 1041 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GS(-1))	-0.994906	0.031010	-32.08370	0.0000
R-squared	0.497430	Mean dependent var		0.003458
Adjusted R-squared	0.497430	S.D. dependent var		17.26535
S.E. of regression	12.23978	Akaike info criterion		7.848220
Sum squared resid	155804.7	Schwarz criterion		7.852973
Log likelihood	-4083.998	Hannan-Quinn criter.		7.850022
Durbin-Watson stat	2.000001			

- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: D(GS) has a unit root  
Exogenous: Constant  
Bandwidth: 5 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-32.12591	0.0000
Test critical values:		
1% level	-3.436413	
5% level	-2.864106	
10% level	-2.568188	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	149.4016
HAC corrected variance (Bartlett kernel)	149.6806

Phillips-Perron Test Equation  
Dependent Variable: D(GS,2)  
Method: Least Squares  
Date: 05/22/10 Time: 16:08  
Sample (adjusted): 3 1043  
Included observations: 1041 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GS(-1))	-0.996686	0.031024	-32.12576	0.0000
C	0.516881	0.379538	1.361868	0.1735

R-squared	0.498326	Mean dependent var	0.003458
Adjusted R-squared	0.497843	S.D. dependent var	17.26535
S.E. of regression	12.23475	Akaike info criterion	7.848357
Sum squared resid	155527.0	Schwarz criterion	7.857863
Log likelihood	-4083.070	Hannan-Quinn criter.	7.851963
F-statistic	1032.065	Durbin-Watson stat	1.999976
Prob(F-statistic)	0.000000		

- กรณีมีทั้งค่าคงที่และแนวโน้มของเวลา

Null Hypothesis: D(GS) has a unit root  
Exogenous: Constant, Linear Trend  
Bandwidth: 5 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-32.11211	0.0000
Test critical values:		
1% level	-3.966888	
5% level	-3.414136	
10% level	-3.129172	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	149.3938
HAC corrected variance (Bartlett kernel)	149.6523

Phillips-Perron Test Equation  
Dependent Variable: D(GS,2)  
Method: Least Squares  
Date: 05/22/10 Time: 16:09  
Sample (adjusted): 3 1043  
Included observations: 1041 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GS(-1))	-0.996735	0.031039	-32.11197	0.0000
C	0.363942	0.760476	0.478571	0.6323
@TREND(1)	0.000293	0.001262	0.232114	0.8165
R-squared	0.498352	Mean dependent var		0.003458
Adjusted R-squared	0.497385	S.D. dependent var		17.26535
S.E. of regression	12.24033	Akaike info criterion		7.850227
Sum squared resid	155519.0	Schwarz criterion		7.864486
Log likelihood	-4083.043	Hannan-Quinn criter.		7.855636
F-statistic	515.5893	Durbin-Watson stat		1.999980
Prob(F-statistic)	0.000000			

### ราคาน้ำมันในตลาดปัจจุบัน

ที่ Order of integration = 0 หรือ I(0)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: OS has a unit root  
Exogenous: None  
Bandwidth: 5 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-0.147361	0.6327
Test critical values:		
1% level	-2.567183	
5% level	-1.941127	
10% level	-1.616495	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	2.972669
HAC corrected variance (Bartlett kernel)	3.278630

Phillips-Perron Test Equation  
Dependent Variable: D(OS)  
Method: Least Squares  
Date: 05/22/10 Time: 16:09  
Sample (adjusted): 2 1043  
Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OS(-1)	-8.11E-05	0.000687	-0.117911	0.9062

R-squared	-0.000058	Mean dependent var	0.014520
Adjusted R-squared	-0.000058	S.D. dependent var	1.724921
S.E. of regression	1.724971	Akaike info criterion	3.929257
Sum squared resid	3097.521	Schwarz criterion	3.934006
Log likelihood	-2046.143	Hannan-Quinn criter.	3.931058
Durbin-Watson stat	1.865063		



- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: OS has a unit root  
Exogenous: Constant  
Bandwidth: 6 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-1.421291	0.5730
Test critical values:		
1% level	-3.436407	
5% level	-2.864103	
10% level	-2.568186	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	2.967293
HAC corrected variance (Bartlett kernel)	3.325450

Phillips-Perron Test Equation  
Dependent Variable: D(OS)  
Method: Least Squares  
Date: 05/22/10 Time: 16:10  
Sample (adjusted): 2 1043  
Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OS(-1)	-0.003309	0.002450	-1.350712	0.1771
C	0.261401	0.190423	1.372736	0.1701

R-squared	0.001751	Mean dependent var	0.014520
Adjusted R-squared	0.000791	S.D. dependent var	1.724921
S.E. of regression	1.724239	Akaike info criterion	3.929366
Sum squared resid	3091.919	Schwarz criterion	3.938865
Log likelihood	-2045.200	Hannan-Quinn criter.	3.932969
F-statistic	1.824424	Durbin-Watson stat	1.862424
Prob(F-statistic)	0.177081		

- กรณีมีทั้งค่าคงที่และแนวโน้มเวลา

Null Hypothesis: OS has a unit root  
Exogenous: Constant, Linear Trend  
Bandwidth: 6 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-1.405444	0.8592
Test critical values:		
1% level	-3.966879	
5% level	-3.414131	
10% level	-3.129170	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	2.967019
HAC corrected variance (Bartlett kernel)	3.322931

Phillips-Perron Test Equation  
Dependent Variable: D(OS)  
Method: Least Squares  
Date: 05/22/10 Time: 16:10  
Sample (adjusted): 2 1043  
Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OS(-1)	-0.003274	0.002454	-1.334233	0.1824
C	0.287464	0.208290	1.380113	0.1678
@TREND(1)	-5.50E-05	0.000178	-0.309480	0.7570
R-squared	0.001843	Mean dependent var		0.014520
Adjusted R-squared	-0.000078	S.D. dependent var		1.724921
S.E. of regression	1.724989	Akaike info criterion		3.931193
Sum squared resid	3091.634	Schwarz criterion		3.945441
Log likelihood	-2045.152	Hannan-Quinn criter.		3.936598
F-statistic	0.959308	Durbin-Watson stat		1.862661
Prob(F-statistic)	0.383497			

ที่ Order of integration = 1 หรือ I(1)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: D(OS) has a unit root  
Exogenous: None  
Bandwidth: 4 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-30.13789	0.0000
Test critical values:		
1% level	-2.567185	
5% level	-1.941128	
10% level	-1.616495	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	2.960482
HAC corrected variance (Bartlett kernel)	2.887907

Phillips-Perron Test Equation  
Dependent Variable: D(OS,2)  
Method: Least Squares  
Date: 05/22/10 Time: 16:10  
Sample (adjusted): 3 1043  
Included observations: 1041 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OS(-1))	-0.933426	0.030948	-30.16089	0.0000
R-squared	0.466579	Mean dependent var		0.000480
Adjusted R-squared	0.466579	S.D. dependent var		2.356974
S.E. of regression	1.721432	Akaike info criterion		3.925151
Sum squared resid	3081.862	Schwarz criterion		3.929904
Log likelihood	-2042.041	Hannan-Quinn criter.		3.926953
Durbin-Watson stat	1.994852			

- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: D(OS) has a unit root  
Exogenous: Constant  
Bandwidth: 3 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-30.11841	0.0000
Test critical values:		
1% level	-3.436413	
5% level	-2.864106	
10% level	-2.568188	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	2.960330
HAC corrected variance (Bartlett kernel)	2.864775

Phillips-Perron Test Equation  
Dependent Variable: D(OS,2)  
Method: Least Squares  
Date: 05/22/10 Time: 16:11  
Sample (adjusted): 3 1043  
Included observations: 1041 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OS(-1))	-0.933479	0.030963	-30.14805	0.0000
C	0.012335	0.053379	0.231079	0.8173

R-squared	0.466606	Mean dependent var	0.000480
Adjusted R-squared	0.466093	S.D. dependent var	2.356974
S.E. of regression	1.722216	Akaike info criterion	3.927020
Sum squared resid	3081.704	Schwarz criterion	3.936526
Log likelihood	-2042.014	Hannan-Quinn criter.	3.930626
F-statistic	908.9047	Durbin-Watson stat	1.994852
Prob(F-statistic)	0.000000		

- กรณีมีทั้งค่าคงที่และแนวโน้มเวลา

Null Hypothesis: D(OS) has a unit root  
Exogenous: Constant, Linear Trend  
Bandwidth: 3 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-30.10622	0.0000
Test critical values:		
1% level	-3.966888	
5% level	-3.414136	
10% level	-3.129172	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	2.960072
HAC corrected variance (Bartlett kernel)	2.864179

Phillips-Perron Test Equation  
Dependent Variable: D(OS,2)  
Method: Least Squares  
Date: 05/22/10 Time: 16:12  
Sample (adjusted): 3 1043  
Included observations: 1041 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OS(-1))	-0.933604	0.030979	-30.13617	0.0000
C	0.040242	0.107046	0.375928	0.7070
@TREND(1)	-5.35E-05	0.000178	-0.300804	0.7636
R-squared	0.466653	Mean dependent var		0.000480
Adjusted R-squared	0.465625	S.D. dependent var		2.356974
S.E. of regression	1.722970	Akaike info criterion		3.928854
Sum squared resid	3081.435	Schwarz criterion		3.943114
Log likelihood	-2041.969	Hannan-Quinn criter.		3.934263
F-statistic	454.0998	Durbin-Watson stat		1.994785
Prob(F-statistic)	0.000000			

### ราคาทองคำในตลาดซื้อขายล่วงหน้า

ที่ Order of integration = 0 หรือ I(0)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: GF has a unit root  
Exogenous: None  
Bandwidth: 4 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	0.771688	0.8789
Test critical values:		
1% level	-2.584214	
5% level	-1.943494	
10% level	-1.614970	
*MacKinnon (1996) one-sided p-values.		
Residual variance (no correction)		191.4724
HAC corrected variance (Bartlett kernel)		160.3444

Phillips-Perron Test Equation  
Dependent Variable: D(GF)  
Method: Least Squares  
Date: 05/24/10 Time: 15:15  
Sample (adjusted): 2 122  
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GF(-1)	0.000785	0.001129	0.695124	0.4883
R-squared	-0.000799	Mean dependent var		0.961157
Adjusted R-squared	-0.000799	S.D. dependent var		13.88934
S.E. of regression	13.89489	Akaike info criterion		8.109150
Sum squared resid	23168.16	Schwarz criterion		8.132255
Log likelihood	-489.6036	Hannan-Quinn criter.		8.118534
Durbin-Watson stat	2.231766			

- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: GF has a unit root  
Exogenous: Constant  
Bandwidth: 5 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-1.960861	0.3038
Test critical values:		
1% level	-3.485115	
5% level	-2.885450	
10% level	-2.579598	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	185.1698
HAC corrected variance (Bartlett kernel)	180.2503

Phillips-Perron Test Equation  
Dependent Variable: D(GF)  
Method: Least Squares  
Date: 05/24/10 Time: 15:17  
Sample (adjusted): 2 122  
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GF(-1)	-0.066562	0.033482	-1.988008	0.0491
C	75.40529	37.46737	2.012559	0.0464

R-squared	0.032144	Mean dependent var	0.961157
Adjusted R-squared	0.024011	S.D. dependent var	13.88934
S.E. of regression	13.72158	Akaike info criterion	8.092208
Sum squared resid	22405.54	Schwarz criterion	8.138420
Log likelihood	-487.5786	Hannan-Quinn criter.	8.110976
F-statistic	3.952176	Durbin-Watson stat	2.157373
Prob(F-statistic)	0.049107		

- กรณีมีทั้งค่าคงที่และแนวโน้มเวลา

Null Hypothesis: GF has a unit root  
Exogenous: Constant, Linear Trend  
Bandwidth: 5 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.198004	0.4861
Test critical values:		
1% level	-4.035648	
5% level	-3.447383	
10% level	-3.148761	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	183.8448
HAC corrected variance (Bartlett kernel)	185.3903

Phillips-Perron Test Equation  
Dependent Variable: D(GF)  
Method: Least Squares  
Date: 05/24/10 Time: 15:17  
Sample (adjusted): 2 122  
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GF(-1)	-0.079587	0.036358	-2.188962	0.0306
C	87.79078	39.82399	2.204470	0.0294
@TREND(1)	0.035764	0.038782	0.922187	0.3583
R-squared	0.039069	Mean dependent var		0.961157
Adjusted R-squared	0.022783	S.D. dependent var		13.88934
S.E. of regression	13.73022	Akaike info criterion		8.101556
Sum squared resid	22245.22	Schwarz criterion		8.170873
Log likelihood	-487.1441	Hannan-Quinn criter.		8.129708
F-statistic	2.398819	Durbin-Watson stat		2.144670
Prob(F-statistic)	0.095242			



ที่ Order of integration = 1 หรือ I(1)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: D(GF) has a unit root  
Exogenous: None  
Bandwidth: 5 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-12.17272	0.0000
Test critical values:		
1% level	-2.584375	
5% level	-1.943516	
10% level	-1.614956	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	191.3354
HAC corrected variance (Bartlett kernel)	199.6710

Phillips-Perron Test Equation  
Dependent Variable: D(GF,2)  
Method: Least Squares  
Date: 05/24/10 Time: 15:18  
Sample (adjusted): 3 122  
Included observations: 120 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GF(-1))	-1.113820	0.091317	-12.19735	0.0000
R-squared	0.555591	Mean dependent var		0.082500
Adjusted R-squared	0.555591	S.D. dependent var		20.83642
S.E. of regression	13.89040	Akaike info criterion		8.108572
Sum squared resid	22960.25	Schwarz criterion		8.131801
Log likelihood	-485.5143	Hannan-Quinn criter.		8.118005
Durbin-Watson stat	2.007853			

- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: D(GF) has a unit root  
Exogenous: Constant  
Bandwidth: 4 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-12.20399	0.0000
Test critical values:		
1% level	-3.485586	
5% level	-2.885654	
10% level	-2.579708	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	190.2096
HAC corrected variance (Bartlett kernel)	192.1096

Phillips-Perron Test Equation  
Dependent Variable: D(GF,2)  
Method: Least Squares  
Date: 05/24/10 Time: 15:18  
Sample (adjusted): 3 122  
Included observations: 120 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GF(-1))	-1.118654	0.091615	-12.21034	0.0000
C	1.063187	1.272162	0.835732	0.4050

R-squared	0.558206	Mean dependent var	0.082500
Adjusted R-squared	0.554461	S.D. dependent var	20.83642
S.E. of regression	13.90804	Akaike info criterion	8.119337
Sum squared resid	22825.15	Schwarz criterion	8.165795
Log likelihood	-485.1602	Hannan-Quinn criter.	8.138204
F-statistic	149.0925	Durbin-Watson stat	2.011014
Prob(F-statistic)	0.000000		

- กรณีมีทั้งค่าคงที่และแนวโน้มเวลา

Null Hypothesis: D(GF) has a unit root  
Exogenous: Constant, Linear Trend  
Bandwidth: 4 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-12.15206	0.0000
Test critical values:		
1% level	-4.036310	
5% level	-3.447699	
10% level	-3.148946	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	190.2002
HAC corrected variance (Bartlett kernel)	192.1971

Phillips-Perron Test Equation  
Dependent Variable: D(GF,2)  
Method: Least Squares  
Date: 05/24/10 Time: 15:18  
Sample (adjusted): 3 122  
Included observations: 120 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GF(-1))	-1.118630	0.092004	-12.15845	0.0000
C	0.891514	2.599552	0.342949	0.7323
@TREND(1)	0.002791	0.036808	0.075828	0.9397
R-squared	0.558227	Mean dependent var		0.082500
Adjusted R-squared	0.550676	S.D. dependent var		20.83642
S.E. of regression	13.96700	Akaike info criterion		8.135954
Sum squared resid	22824.03	Schwarz criterion		8.205642
Log likelihood	-485.1573	Hannan-Quinn criter.		8.164255
F-statistic	73.92102	Durbin-Watson stat		2.011151
Prob(F-statistic)	0.000000			

### ราคาน้ำมันในตลาดซื้อขายล่วงหน้า

ที่ Order of integration = 0 หรือ I(0)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: OF has a unit root  
Exogenous: None  
Bandwidth: 0 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	0.911175	0.9025
Test critical values:		
1% level	-2.584214	
5% level	-1.943494	
10% level	-1.614970	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	1.886822
HAC corrected variance (Bartlett kernel)	1.886822

Phillips-Perron Test Equation  
Dependent Variable: D(OF)  
Method: Least Squares  
Date: 05/24/10 Time: 15:19  
Sample (adjusted): 2 122  
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OF(-1)	0.001453	0.001595	0.911175	0.3640
R-squared	-0.001271	Mean dependent var		0.124298
Adjusted R-squared	-0.001271	S.D. dependent var		1.378452
S.E. of regression	1.379328	Akaike info criterion		3.489300
Sum squared resid	228.3054	Schwarz criterion		3.512405
Log likelihood	-210.1026	Hannan-Quinn criter.		3.498684
Durbin-Watson stat	2.141648			

- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: OF has a unit root  
Exogenous: Constant  
Bandwidth: 3 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-1.488397	0.5362
Test critical values:		
1% level	-3.485115	
5% level	-2.885450	
10% level	-2.579598	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	1.847742
HAC corrected variance (Bartlett kernel)	1.765337

Phillips-Perron Test Equation  
Dependent Variable: D(OF)  
Method: Least Squares  
Date: 05/24/10 Time: 15:19  
Sample (adjusted): 2 122  
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OF(-1)	-0.047236	0.030731	-1.537059	0.1269
C	3.833525	2.416413	1.586453	0.1153

R-squared	0.019467	Mean dependent var	0.124298
Adjusted R-squared	0.011227	S.D. dependent var	1.378452
S.E. of regression	1.370692	Akaike info criterion	3.484899
Sum squared resid	223.5768	Schwarz criterion	3.531111
Log likelihood	-208.8364	Hannan-Quinn criter.	3.503668
F-statistic	2.362550	Durbin-Watson stat	2.082864
Prob(F-statistic)	0.126934		

- กรณีมีทั้งค่าคงที่และแนวโน้ม

Null Hypothesis: OF has a unit root  
Exogenous: Constant, Linear Trend  
Bandwidth: 4 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.210900	0.4790
Test critical values:		
1% level	-4.035648	
5% level	-3.447383	
10% level	-3.148761	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	1.810695
HAC corrected variance (Bartlett kernel)	1.872437

Phillips-Perron Test Equation  
Dependent Variable: D(OF)  
Method: Least Squares  
Date: 05/24/10 Time: 15:20  
Sample (adjusted): 2 122  
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OF(-1)	-0.083092	0.038286	-2.170280	0.0320
C	6.227888	2.853954	2.182196	0.0311
@TREND(1)	0.006906	0.004445	1.553804	0.1229
R-squared	0.039127	Mean dependent var		0.124298
Adjusted R-squared	0.022841	S.D. dependent var		1.378452
S.E. of regression	1.362619	Akaike info criterion		3.481175
Sum squared resid	219.0941	Schwarz criterion		3.550492
Log likelihood	-207.6111	Hannan-Quinn criter.		3.509327
F-statistic	2.402467	Durbin-Watson stat		2.050401
Prob(F-statistic)	0.094909			

ที่ Order of integration = 1 หรือ I(1)

- กรณีไม่มีค่าคงที่และแนวโน้มเวลา

Null Hypothesis: D(OF) has a unit root  
Exogenous: None  
Bandwidth: 1 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-11.63419	0.0000
Test critical values:		
1% level	-2.584375	
5% level	-1.943516	
10% level	-1.614956	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	1.903861
HAC corrected variance (Bartlett kernel)	1.893827

Phillips-Perron Test Equation  
Dependent Variable: D(OF,2)  
Method: Least Squares  
Date: 05/24/10 Time: 15:20  
Sample (adjusted): 3 122  
Included observations: 120 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OF(-1))	-1.063702	0.091444	-11.63228	0.0000
R-squared	0.532067	Mean dependent var		-0.001333
Adjusted R-squared	0.532067	S.D. dependent var		2.025550
S.E. of regression	1.385590	Akaike info criterion		3.498428
Sum squared resid	228.4633	Schwarz criterion		3.521657
Log likelihood	-208.9057	Hannan-Quinn criter.		3.507861
Durbin-Watson stat	2.000519			

- กรณีมีเฉพาะค่าคงที่

Null Hypothesis: D(OF) has a unit root  
Exogenous: Constant  
Bandwidth: 1 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-11.67885	0.0000
Test critical values:		
1% level	-3.485586	
5% level	-2.885654	
10% level	-2.579708	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	1.887557
HAC corrected variance (Bartlett kernel)	1.878228

Phillips-Perron Test Equation  
Dependent Variable: D(OF,2)  
Method: Least Squares  
Date: 05/24/10 Time: 15:20  
Sample (adjusted): 3 122  
Included observations: 120 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OF(-1))	-1.071797	0.091787	-11.67694	0.0000
C	0.128175	0.126962	1.009561	0.3148

R-squared	0.536074	Mean dependent var	-0.001333
Adjusted R-squared	0.532143	S.D. dependent var	2.025550
S.E. of regression	1.385478	Akaike info criterion	3.506494
Sum squared resid	226.5069	Schwarz criterion	3.552952
Log likelihood	-208.3896	Hannan-Quinn criter.	3.525361
F-statistic	136.3510	Durbin-Watson stat	2.001787
Prob(F-statistic)	0.000000		



- กรณีมีทั้งค่าคงที่และแนวโน้มเวลา

Null Hypothesis: D(OF) has a unit root  
Exogenous: Constant, Linear Trend  
Bandwidth: 0 (Newey-West using Bartlett kernel)

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-11.64091	0.0000
Test critical values:		
1% level	-4.036310	
5% level	-3.447699	
10% level	-3.148946	

\*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	1.885105
HAC corrected variance (Bartlett kernel)	1.885105

Phillips-Perron Test Equation  
Dependent Variable: D(OF,2)  
Method: Least Squares  
Date: 05/24/10 Time: 15:21  
Sample (adjusted): 3 122  
Included observations: 120 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OF(-1))	-1.072651	0.092145	-11.64091	0.0000
C	0.040325	0.258712	0.155870	0.8764
@TREND(1)	0.001430	0.003665	0.390171	0.6971
R-squared	0.536677	Mean dependent var		-0.001333
Adjusted R-squared	0.528757	S.D. dependent var		2.025550
S.E. of regression	1.390482	Akaike info criterion		3.521860
Sum squared resid	226.2126	Schwarz criterion		3.591548
Log likelihood	-208.3116	Hannan-Quinn criter.		3.550161
F-statistic	67.76180	Durbin-Watson stat		2.002728
Prob(F-statistic)	0.000000			

ภาคผนวก ข

การทดสอบความสัมพันธ์เชิงดุลยภาพในระยะยาว (Cointegration)

ตลาดปัจจุบัน

- ราคาน้ำมันเป็นตัวแทนปริมาตร

Dependent Variable: GS

Method: Least Squares

Date: 05/22/10 Time: 16:38

Sample: 1 1043

Included observations: 1043

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OS	1.901169	0.223240	8.516254	0.0000
C	666.9758	17.35194	38.43811	0.0000
R-squared	0.065132	Mean dependent var		808.8221
Adjusted R-squared	0.064234	S.D. dependent var		162.4243
S.E. of regression	157.1211	Akaike info criterion		12.95383
Sum squared resid	25699203	Schwarz criterion		12.96332
Log likelihood	-6753.420	Hannan-Quinn criter.		12.95743
F-statistic	72.52658	Durbin-Watson stat		0.005385
Prob(F-statistic)	0.000000			

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 0 (Fixed)

Augmented Dickey-Fuller test statistic	t-Statistic	Prob.*
Test critical values:		
1% level	-0.853106	0.3463
5% level	-2.567183	
10% level	-1.941127	
	-1.616495	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 05/24/10 Time: 22:18

Sample (adjusted): 2 1043

Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.001943	0.002278	-0.853106	0.3938
R-squared	-0.001116	Mean dependent var		0.490677
Adjusted R-squared	-0.001116	S.D. dependent var		11.51992
S.E. of regression	11.52635	Akaike info criterion		7.728107
Sum squared resid	138303.8	Schwarz criterion		7.732857
Log likelihood	-4025.344	Hannan-Quinn criter.		7.729909
Durbin-Watson stat	2.038311			

- ราคาทองคำเป็นตัวแปรอิสระ

Dependent Variable: OS

Method: Least Squares

Date: 05/22/10 Time: 16:40

Sample: 1 1043

Included observations: 1043

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GS	0.034259	0.004023	8.516254	0.0000
C	46.90053	3.318617	14.13255	0.0000
R-squared	0.065132	Mean dependent var	74.61005	
Adjusted R-squared	0.064234	S.D. dependent var	21.80361	
S.E. of regression	21.09172	Akaike info criterion	8.937554	
Sum squared resid	463100.1	Schwarz criterion	8.947046	
Log likelihood	-4658.935	Hannan-Quinn criter.	8.941154	
F-statistic	72.52658	Durbin-Watson stat	0.005971	
Prob(F-statistic)	0.000000			

Null Hypothesis: E2 has a unit root  
Exogenous: None  
Lag Length: 0 (Fixed)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.226577	0.2022
Test critical values:		
1% level	-2.567183	
5% level	-1.941127	
10% level	-1.616495	

\*Mackinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E2)

Method: Least Squares

Date: 05/24/10 Time: 22:21

Sample (adjusted): 2 1043

Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E2(-1)	-0.002936	0.002393	-1.226577	0.2203
R-squared	0.001439	Mean dependent var		-0.003236
Adjusted R-squared	0.001439	S.D. dependent var		1.629747
S.E. of regression	1.628574	Akaike info criterion		3.814246
Sum squared resid	2760.995	Schwarz criterion		3.818995
Log likelihood	-1986.222	Hannan-Quinn criter.		3.816047
Durbin-Watson stat	1.902576			

### ผลการทดสอบสมมติฐาน

- ราคาน้ำมันเป็นตัวแทนปริมาตร

Null Hypothesis: E1 has a unit root  
Exogenous: None  
Lag Length: 0 (Fixed)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.969453	0.0472
Test critical values:		
1% level	-2.584214	
5% level	-1.943494	
10% level	-1.614970	

\*MacKinnon (1996) one-sided p-values.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OF	3.801846	0.756087	5.028319	0.0000
C	820.1081	59.50885	13.78128	0.0000
R-squared	0.174032	Mean dependent var	1118.928	
Adjusted R-squared	0.167148	S.D. dependent var	37.67755	
S.E. of regression	34.38480	Akaike info criterion	9.929364	
Sum squared resid	141877.7	Schwarz criterion	9.975331	
Log likelihood	-603.6912	Hannan-Quinn criter.	9.948034	
F-statistic	25.28399	Durbin-Watson stat	0.121787	
Prob(F-statistic)	0.000002			

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(E1)  
Method: Least Squares  
Date: 05/24/10 Time: 22:39  
Sample (adjusted): 2 122  
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.061922	0.031441	-1.969453	0.0512
R-squared	0.029689	Mean dependent var	0.488597	
Adjusted R-squared	0.029689	S.D. dependent var	11.98959	
S.E. of regression	11.81027	Akaike info criterion	7.784046	
Sum squared resid	16737.89	Schwarz criterion	7.807152	
Log likelihood	-469.9348	Hannan-Quinn criter.	7.793430	
Durbin-Watson stat	2.078062			

- ราคาทองคำเป็นตัวแปรอิสระ

Dependent Variable: OF

Method: Least Squares

Date: 05/24/10 Time: 22:46

Sample: 1 122

Included observations: 122

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GF	0.045776	0.009104	5.028319	0.0000
C	27.37909	10.19194	2.686348	0.0082
R-squared	0.174032	Mean dependent var		78.59861
Adjusted R-squared	0.167148	S.D. dependent var		4.134302
S.E. of regression	3.772993	Akaike info criterion		5.509872
Sum squared resid	1708.257	Schwarz criterion		5.555839
Log likelihood	-334.1022	Hannan-Quinn criter.		5.528542
F-statistic	25.28399	Durbin-Watson stat		0.097519
Prob(F-statistic)	0.000002			

Null Hypothesis: E2 has a unit root

Exogenous: None

Lag Length: 0 (Fixed)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.507615	0.1229
Test critical values:		
1% level	-2.584214	
5% level	-1.943494	
10% level	-1.614970	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E2)

Method: Least Squares

Date: 05/24/10 Time: 22:52

Sample (adjusted): 2 122

Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E2(-1)	-0.043036	0.028546	-1.507615	0.1343
R-squared	0.013971	Mean dependent var		0.080300
Adjusted R-squared	0.013971	S.D. dependent var		1.175471
S.E. of regression	1.167231	Akaike info criterion		3.155375
Sum squared resid	163.4913	Schwarz criterion		3.178481
Log likelihood	-189.9002	Hannan-Quinn criter.		3.164759
Durbin-Watson stat	1.962556			

## ภาคผนวก ก

ขั้นตอนหลังจากการทดสอบความสัมพันธ์เชิงดุลยภาพในระยะยาว แยกออกเป็น 2 กรณีคือ

- กรณีตัวแปรมีความสัมพันธ์เชิงดุลยภาพในระยะยาวต่อกัน จะทำการทดสอบการปรับตัวในระยะสั้นตามแบบจำลองเออร์เรอร์คอร์เรกชัน (Error Correction Model : ECM) ต่อไป
- กรณีตัวแปรไม่มีความสัมพันธ์เชิงดุลยภาพในระยะยาวต่อกัน จะนำผลต่างระดับที่ 1 ของตัวแปรมาใช้ในการหาความสัมพันธ์ด้วยวิธี Ordinary Least Squares (OLS) ต่อไป

การทดสอบการปรับตัวในระยะสั้นตามแบบจำลองเออร์เรอร์คอร์เรกชัน (Error Correction Model : ECM) กรณีตลาดซื้อขายล่วงหน้า

Dependent Variable: D(GF)  
Method: Least Squares  
Date: 05/24/10 Time: 22:42  
Sample (adjusted): 2 122  
Included observations: 121 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.055252	0.031539	-1.751870	0.0824
D(OF)	5.135099	0.784543	6.545338	0.0000
C	0.310133	1.073223	0.288974	0.7731

R-squared	0.295391	Mean dependent var	0.961157
Adjusted R-squared	0.283449	S.D. dependent var	13.88934
S.E. of regression	11.75724	Akaike info criterion	7.791296
Sum squared resid	16311.46	Schwarz criterion	7.860613
Log likelihood	-468.3734	Hannan-Quinn criter.	7.819449
F-statistic	24.73442	Durbin-Watson stat	2.039005
Prob(F-statistic)	0.000000		

การหาความสัมพันธ์ด้วยวิธี Ordinary Least Squares (OLS) ของผลต่างระดับที่ 1 ของตัวแปร

Dependent Variable: DGS  
 Method: Least Squares  
 Date: 05/24/10 Time: 22:27  
 Sample (adjusted): 2 1043  
 Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DOS	2.426255	0.206451	11.75221	0.0000
C	0.483053	0.355954	1.357066	0.1751
R-squared	0.117233	Mean dependent var		0.518282
Adjusted R-squared	0.116385	S.D. dependent var		12.22306
S.E. of regression	11.48978	Akaike info criterion		7.722711
Sum squared resid	137295.7	Schwarz criterion		7.732209
Log likelihood	-4021.532	Hannan-Quinn criter.		7.726314
F-statistic	138.1144	Durbin-Watson stat		2.055439
Prob(F-statistic)	0.000000			

Null Hypothesis: E3 has a unit root  
 Exogenous: None  
 Lag Length: 0 (Fixed)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-33.15902	0.0000
Test critical values:		
1% level	-2.567185	
5% level	-1.941128	
10% level	-1.616495	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(E3)  
 Method: Least Squares  
 Date: 05/24/10 Time: 22:29  
 Sample (adjusted): 3 1043  
 Included observations: 1041 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E3(-1)	-1.027776	0.030995	-33.15902	0.0000
R-squared	0.513910	Mean dependent var		0.002293
Adjusted R-squared	0.513910	S.D. dependent var		16.47267
S.E. of regression	11.48477	Akaike info criterion		7.720881
Sum squared resid	137176.0	Schwarz criterion		7.725634
Log likelihood	-4017.719	Hannan-Quinn criter.		7.722684
Durbin-Watson stat	1.999833			

Dependent Variable: DOS  
 Method: Least Squares  
 Date: 05/24/10 Time: 22:32  
 Sample (adjusted): 2 1043  
 Included observations: 1042 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DGS	0.048319	0.004111	11.75221	0.0000
C	-0.010523	0.050276	-0.209297	0.8343
R-squared	0.117233	Mean dependent var		0.014520
Adjusted R-squared	0.116385	S.D. dependent var		1.724921
S.E. of regression	1.621440	Akaike info criterion		3.806424
Sum squared resid	2734.231	Schwarz criterion		3.815923
Log likelihood	-1981.147	Hannan-Quinn criter.		3.810027
F-statistic	138.1144	Durbin-Watson stat		1.927459
Prob(F-statistic)	0.000000			

Null Hypothesis: E4 has a unit root  
 Exogenous: None  
 Lag Length: 0 (Fixed)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-31.12126	0.0000
Test critical values:		
1% level	-2.567185	
5% level	-1.941128	
10% level	-1.616495	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(E4)  
 Method: Least Squares  
 Date: 05/24/10 Time: 22:34  
 Sample (adjusted): 3 1043  
 Included observations: 1041 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E4(-1)	-0.964606	0.030995	-31.12126	0.0000
R-squared	0.482209	Mean dependent var		0.000313
Adjusted R-squared	0.482209	S.D. dependent var		2.251093
S.E. of regression	1.619835	Akaike info criterion		3.803485
Sum squared resid	2728.819	Schwarz criterion		3.808238
Log likelihood	-1978.714	Hannan-Quinn criter.		3.805288
Durbin-Watson stat	1.996696			



## ประวัติผู้เขียน

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