ภาคผนวก

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ผลการทดสอบ Unit roots

ตาราง 1 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ CPI รูปสมการ Intercept

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.355993	0.9792
Test critical values:	1% level	-3.555023	
	5% level	-2.915522	
	10% level	-2.595565	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CPI)
Method: Least Squares
Date: 09/21/07 Time: 13:06
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPI(-1)	0.004200	0.011797	0.355993	0.723300
D(CPI(-1))	0.366902	0.131235	2.795756	0.007200
C	-0.261603	1.267813	-0.206342	0.837300

R-squared	0.138394	Mean dependent var	0.298182
Adjusted R-squared	0.105255	S.D. dependent var	0.492721
S.E. of regression	0.466070	Akaike info criterion	1.364040
Sum squared resid	11.295500	Schwarz criterion	1.473530
Log likelihood	-34.511090	F-statistic	4.176191
Durbin-Watson stat	1.803749	Prob(F-statistic)	0.020799

ตาราง 2 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ CPI รูปสมการ Intercept and Trend

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.915254	0.1659
Test critical values:	1% level	-4.133838	
	5% level	-3.493692	
	10% level	-3.175693	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CPI)
Method: Least Squares
Date: 09/21/07 Time: 13:07
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPI(-1)	-0.151459	0.051954	-2.915254	0.0053
D(CPI(-1))	0.417698	0.122897	3.398757	0.0013
C	14.93372	5.095539	2.930745	0.0050
@TREND(2002M09)	0.053712	0.017525	3.064885	0.0035

R-squared	0.272407	Mean dependent var	0.298182
Adjusted R-squared	0.229607	S.D. dependent var	0.492721
S.E. of regression	0.432472	Akaike info criterion	1.231347
Sum squared resid	9.538618	Schwarz criterion	1.377335
Log likelihood	-29.86204	F-statistic	6.364697
Durbin-Watson stat	1.909517	Prob(F-statistic)	0.000951

ตาราง 3 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ CPI รูปสมการ none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		2.611704	0.9975
Test critical values:	1% level	-2.607686	
	5% level	-1.946878	
	10% level	-1.612999	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CPI)
Method: Least Squares
Date: 09/21/07 Time: 13:08
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPI(-1)	0.001769	0.000678	2.611704	0.0117
D(CPI(-1))	0.369671	0.129363	2.857636	0.0061

R-squared	0.137688	Mean dependent var	0.298182
Adjusted R-squared	0.121418	S.D. dependent var	0.492721
S.E. of regression	0.461841	Akaike info criterion	1.328494
Sum squared resid	11.30475	Schwarz criterion	1.401488
Log likelihood	-34.53359	Durbin-Watson stat	1.802667

ตาราง 4 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ EXC รูปสมการ Intercept

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.862211	0.7928
Test critical values:	1% level	-3.555023	
	5% level	-2.915522	
	10% level	-2.595565	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXC)
Method: Least Squares
Date: 09/21/07 Time: 13:14
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXC(-1)	-0.028518	0.033076	-0.862211	0.3925
D(EXC(-1))	0.325817	0.13158	2.476193	0.0166
C	1.017994	1.323427	0.769211	0.4452

R-squared	0.106286	Mean dependent var	-0.16421
Adjusted R-squared	0.071912	S.D. dependent var	0.530637
S.E. of regression	0.511202	Akaike info criterion	1.548897
Sum squared resid	13.58902	Schwarz criterion	1.658388
Log likelihood	-39.59466	F-statistic	3.092079
Durbin-Watson stat	1.923334	Prob(F-statistic)	0.053847

ตาราง 5 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ EXC รูปสมการ Intercept and trend

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.975014	0.6017
Test critical values:	1% level	-4.133838	
	5% level	-3.493692	
	10% level	-3.175693	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXC)
Method: Least Squares
Date: 09/21/07 Time: 13:15
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXC(-1)	-0.112468	0.056945	-1.975014	0.05370
D(EXC(-1))	0.362695	0.130498	2.779310	0.00760
C	4.756638	2.455648	1.937019	0.05830
@TREND(2002M09)	-0.013507	0.007535	-1.792492	0.07900

R-squared	0.159253	Mean dependent var	-0.164210
Adjusted R-squared	0.109798	S.D. dependent var	0.530637
S.E. of regression	0.500659	Akaike info criterion	1.524165
Sum squared resid	12.78364	Schwarz criterion	1.670153
Log likelihood	-37.91454	F-statistic	3.220124
Durbin-Watson stat	1.952961	Prob(F-statistic)	0.030216

ตาราง 6 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ EXC รูปสมการ none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.753005	0.0756
Test critical values:	1% level	-2.607686	
	5% level	-1.946878	
	10% level	-1.612999	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXC)
Method: Least Squares
Date: 09/21/07 Time: 13:15
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXC(-1)	-0.003113	0.001776	-1.753005	0.0854
D(EXC(-1))	0.298315	0.126140	2.364945	0.0217

R-squared	0.096117	Mean dependent var	-0.164210
Adjusted R-squared	0.079062	S.D. dependent var	0.530637
S.E. of regression	0.509229	Akaike info criterion	1.523848
Sum squared resid	13.74364	Schwarz criterion	1.596842
Log likelihood	-39.90581	Durbin-Watson stat	1.898736

ตาราง 7 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ INT รูปสมการ intercept

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.955395	0.0460
Test critical values:	1% level	-3.562669	
	5% level	-2.918778	

10% level	-2.597285	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INT)
Method: Least Squares
Date: 09/21/07 Time: 13:17
Sample (adjusted): 2003M02 2007M05
Included observations: 52 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INT(-1)	-0.055869	0.018904	-2.955395	0.0049
D(INT(-1))	0.442431	0.133916	3.303788	0.0019
D(INT(-2))	0.037876	0.149001	0.254198	0.8005
D(INT(-3))	0.457756	0.147496	3.103510	0.0033
D(INT(-4))	0.198635	0.130801	1.518605	0.1357
C	0.09932	0.046115	2.153769	0.0365

R-squared	0.562157	Mean dependent var	0.007212
Adjusted R-squared	0.514566	S.D. dependent var	0.238384
S.E. of regression	0.166089	Akaike info criterion	-0.644413
Sum squared resid	1.268943	Schwarz criterion	-0.419270
Log likelihood	22.75474	F-statistic	11.812110
Durbin-Watson stat	2.128388	Prob(F-statistic)	0.000000

ตาราง 8 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ INT รูปสมการ intercept and trend

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.273553	0.4403
Test critical values:	1% level	-4.144584	
	5% level	-3.498692	
	10% level	-3.178578	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INT)
Method: Least Squares
Date: 09/21/07 Time: 13:17
Sample (adjusted): 2003M02 2007M05
Included observations: 52 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INT(-1)	-0.062421	0.027455	-2.273553	0.0278
D(INT(-1))	0.448058	0.136288	3.287575	0.0020
D(INT(-2))	0.036401	0.150529	0.241820	0.8100
D(INT(-3))	0.457525	0.148945	3.071768	0.0036
D(INT(-4))	0.186259	0.137243	1.357153	0.1815
C	0.088166	0.057419	1.535502	0.1317
@TREND(2002M09)	0.000856	0.002577	0.332038	0.7414

R-squared	0.563227	Mean dependent var	0.007212
Adjusted R-squared	0.504991	S.D. dependent var	0.238384
S.E. of regression	0.167719	Akaike info criterion	-0.608399
Sum squared resid	1.265842	Schwarz criterion	-0.345731
Log likelihood	22.81837	F-statistic	9.671406
Durbin-Watson stat	2.130168	Prob(F-statistic)	0.000001

ตาราง 9 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ INT รูปสมการ none

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.080549	0.0371

Test critical values:	1% level	-2.610192
	5% level	-1.947248
	10% level	-1.612797

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INT)
Method: Least Squares
Date: 09/21/07 Time: 13:18
Sample (adjusted): 2003M02 2007M05
Included observations: 52 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INT(-1)	-0.020885	0.010038	-2.080549	0.0430
D(INT(-1))	0.480759	0.137771	3.489558	0.0011
D(INT(-2))	0.008838	0.154027	0.057378	0.9545
D(INT(-3))	0.431828	0.152588	2.830020	0.0068
D(INT(-4))	0.128237	0.131462	0.975464	0.3343

R-squared	0.518004	Mean dependent var	0.007212
Adjusted R-squared	0.476984	S.D. dependent var	0.238384
S.E. of regression	0.172399	Akaike info criterion	-0.586800
Sum squared resid	1.396905	Schwarz criterion	-0.399180
Log likelihood	20.25679	Durbin-Watson stat	2.067180

ตาราง 10 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ MAI Index รูปสมการ intercept

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.421708	0.1406
Test critical values:	1% level	-3.555023	
	5% level	-2.915522	
	10% level	-2.595565	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MAI_INDEX)
Method: Least Squares
Date: 09/21/07 Time: 13:20
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MAI INDEX(-1)	-0.096065	0.039668	-2.421708	0.019
D(MAI_INDEX(-1))	0.517495	0.114897	4.503976	0
C	19.92322	8.260947	2.411735	0.0194

R-squared	0.317087	Mean dependent var	1.864727
Adjusted R-squared	0.290821	S.D. dependent var	21.97148
S.E. of regression	18.5028	Akaike info criterion	8.726722
Sum squared resid	17802.38	Schwarz criterion	8.836213
Log likelihood	-236.9849	F-statistic	12.07217
Durbin-Watson stat	2.1023	Prob(F-statistic)	0.000049

ตาราง 11 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ MAI Index รูปสมการ intercept and trend

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.506535	0.3240
Test critical values:	1% level	-4.133838	
	5% level	-3.493692	
	10% level	-3.175693	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MAI_INDEX)
Method: Least Squares
Date: 09/21/07 Time: 13:20
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MAI INDEX(-1)	-0.100958	0.040278	-2.506535	0.0154
D(MAI_INDEX(-1))	0.506538	0.116118	4.362281	0.0001
C	24.64342	10.18627	2.419279	0.0192
@TREND(2002M09)	-0.128401	0.161014	-0.797454	0.4289

R-squared	0.325497	Mean dependent var	1.864727
Adjusted R-squared	0.28582	S.D. dependent var	21.97148
S.E. of regression	18.56791	Akaike info criterion	8.750694
Sum squared resid	17583.13	Schwarz criterion	8.896682
Log likelihood	-236.6441	F-statistic	8.203747
Durbin-Watson stat	2.093762	Prob(F-statistic)	0.000149

ตาราง 12 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ MAI Index รูปสมการ none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.390158	0.5389
Test critical values:	1% level	-2.607686	
	5% level	-1.946878	
	10% level	-1.612999	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MAI_INDEX)
Method: Least Squares
Date: 09/21/07 Time: 13:21
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MAI INDEX(-1)	-0.004904	0.012568	-0.390158	0.698
D(MAI_INDEX(-1))	0.497895	0.119704	4.159383	0.0001

R-squared	0.240699	Mean dependent var	1.864727
Adjusted R-squared	0.226373	S.D. dependent var	21.97148
S.E. of regression	19.32525	Akaike info criterion	8.796389
Sum squared resid	19793.67	Schwarz criterion	8.869383
Log likelihood	-239.9007	Durbin-Watson stat	2.026709

ตาราง 13 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ SET Index รูปสมการ intercept

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.215917	0.2031
Test critical values:	1% level	-3.552666	
	5% level	-2.914517	
	10% level	-2.595033	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SET_INDEX)
Method: Least Squares
Date: 09/21/07 Time: 13:22
Sample (adjusted): 2002M10 2007M05

Included observations: 56 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SET_INDEX(-1)	-0.080136	0.036164	-2.215917	0.0309
C	57.12718	22.96978	2.487058	0.0160

R-squared	0.083352	Mean dependent var	7.243036
Adjusted R-squared	0.066377	S.D. dependent var	35.349400
S.E. of regression	34.15606	Akaike info criterion	9.934818
Sum squared resid	62998.37	Schwarz criterion	10.007150
Log likelihood	-276.1749	F-statistic	4.910290
Durbin-Watson stat	2.082602	Prob(F-statistic)	0.030932

ตาราง 14 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ SET Index รูปสมการ intercept and trend

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.954212	0.6129
Test critical values:	1% level	-4.130526	
	5% level	-3.492149	
	10% level	-3.174802	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SET_INDEX)
Method: Least Squares
Date: 09/21/07 Time: 13:23
Sample (adjusted): 2002M10 2007M05
Included observations: 56 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SET_INDEX(-1)	-0.109853	0.056213	-1.954212	0.0560
C	66.95764	27.093	2.471400	0.0167
@TREND(2002M09)	0.304139	0.438945	0.692887	0.4914

R-squared	0.091581	Mean dependent var	7.243036
Adjusted R-squared	0.057301	S.D. dependent var	35.349400
S.E. of regression	34.32168	Akaike info criterion	9.961515
Sum squared resid	62432.83	Schwarz criterion	10.070020
Log likelihood	-275.9224	F-statistic	2.671553
Durbin-Watson stat	2.040145	Prob(F-statistic)	0.078449

ตาราง 15 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ SET Index รูปสมการ none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.065812	0.9233
Test critical values:	1% level	-2.606911	
	5% level	-1.946764	
	10% level	-1.613062	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SET_INDEX)
Method: Least Squares
Date: 09/21/07 Time: 13:23
Sample (adjusted): 2002M10 2007M05
Included observations: 56 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SET_INDEX(-1)	0.008012	0.007517	1.065812	0.2912

R-squared	-0.021646	Mean dependent var	7.243036
Adjusted R-squared	-0.021646	S.D. dependent var	35.349400
S.E. of regression	35.72993	Akaike info criterion	10.007550

Sum squared resid	70214.55	Schwarz criterion	10.043720
Log likelihood	-279.2114	Durbin-Watson stat	2.039540

ตาราง 16 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ TVAF รูปสมการ intercept

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.212103	0.0000
Test critical values:	1% level	-3.555023	
	5% level	-2.915522	
	10% level	-2.595565	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TVAF)
Method: Least Squares
Date: 09/21/07 Time: 13:24
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TVAF(-1)	-1.466349	0.203318	-7.212103	0.0000
D(TVAF(-1))	0.287591	0.134807	2.133363	0.0376
C	13.18518	6.691834	1.970338	0.0541

R-squared	0.601853	Mean dependent var	-0.412545
Adjusted R-squared	0.58654	S.D. dependent var	73.919700
S.E. of regression	47.531	Akaike info criterion	10.613640
Sum squared resid	117478.2	Schwarz criterion	10.723130
Log likelihood	-288.8752	F-statistic	39.302560
Durbin-Watson stat	2.008627	Prob(F-statistic)	0.000000

ตาราง 17 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ TVAF รูปสมการ intercept and trend

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.294134	0.0000
Test critical values:	1% level	-4.133838	
	5% level	-3.493692	
	10% level	-3.175693	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TVAF)
Method: Least Squares
Date: 09/21/07 Time: 13:25
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TVAF(-1)	-1.507684	0.206698	-7.294134	0.0000
D(TVAF(-1))	0.311339	0.136448	2.281744	0.0267
C	0.858623	13.33591	0.064384	0.9489
@TREND(2002M09)	0.438603	0.410639	1.068098	0.2905

R-squared	0.610565	Mean dependent var	-0.412545
Adjusted R-squared	0.587657	S.D. dependent var	73.919700
S.E. of regression	47.46677	Akaike info criterion	10.627880
Sum squared resid	114907.8	Schwarz criterion	10.773870
Log likelihood	-288.2668	F-statistic	26.652950
Durbin-Watson stat	2.021422	Prob(F-statistic)	0.000000

ตาราง 18 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ TVAF รูปสมการ none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.187591	0.0000
Test critical values:	1% level	-2.606911	
	5% level	-1.946764	
	10% level	-1.613062	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TVAF)
Method: Least Squares
Date: 09/21/07 Time: 13:25
Sample (adjusted): 2002M10 2007M05
Included observations: 56 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TVAF(-1)	-1.099406	0.134277	-8.187591	0

R-squared	0.549314	Mean dependent var	-0.141250
Adjusted R-squared	0.549314	S.D. dependent var	73.272750
S.E. of regression	49.19031	Akaike info criterion	10.646970
Sum squared resid	133082.7	Schwarz criterion	10.683130
Log likelihood	-297.115	Durbin-Watson stat	2.040368

ตาราง 19 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ TVAL รูปสมการ intercept

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.410737	0.0146
Test critical values:	1% level	-3.552666	
	5% level	-2.914517	
	10% level	-2.595033	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TVAL)
Method: Least Squares
Date: 09/21/07 Time: 13:26
Sample (adjusted): 2002M10 2007M05
Included observations: 56 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TVAL(-1)	-0.351004	0.102911	-3.410737	0.0012
C	1.03E+09	3.59E+08	2.86514	0.0059

R-squared	0.177245	Mean dependent var	66735784
Adjusted R-squared	0.162009	S.D. dependent var	1.82E+09
S.E. of regression	1.66E+09	Akaike info criterion	45.33748
Sum squared resid	1.49E+20	Schwarz criterion	45.40981
Log likelihood	-1267.449	F-statistic	11.63313
Durbin-Watson stat	1.684093	Prob(F-statistic)	0.001233

ตาราง 20 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ TVAL รูปสมการ intercept and trend

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.411268	0.0601
Test critical values:	1% level	-4.130526	
	5% level	-3.492149	
	10% level	-3.174802	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TVAL)
Method: Least Squares
Date: 09/21/07 Time: 13:27
Sample (adjusted): 2002M10 2007M05
Included observations: 56 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TVAL(-1)	-0.357522	0.104806	-3.411268	0.0012
C	8.76E+08	5.09E+08	1.721835	0.0909
@TREND(2002M09)	6006623	14007466	0.428816	0.6698

R-squared	0.180089	Mean dependent var	66735784
Adjusted R-squared	0.149149	S.D. dependent var	1.82E+09
S.E. of regression	1.68E+09	Akaike info criterion	45.36973
Sum squared resid	1.49E+20	Schwarz criterion	45.47823
Log likelihood	-1267.352	F-statistic	5.820597
Durbin-Watson stat	1.680022	Prob(F-statistic)	0.005186

ตาราง 21 ก ผลการทดสอบ unit root ที่ระดับ level, I(0) ของ TVAL รูปสมการ none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.762661	0.0741
Test critical values:	1% level	-2.606911	
	5% level	-1.946764	
	10% level	-1.613062	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TVAL)
Method: Least Squares
Date: 09/21/07 Time: 13:27
Sample (adjusted): 2002M10 2007M05
Included observations: 56 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TVAL(-1)	-0.119372	0.067723	-1.762661	0.0835

R-squared	0.05217	Mean dependent var	66735784
Adjusted R-squared	0.05217	S.D. dependent var	1.82E+09
S.E. of regression	1.77E+09	Akaike info criterion	45.44328
Sum squared resid	1.72E+20	Schwarz criterion	45.47945
Log likelihood	-1271.412	Durbin-Watson stat	1.822219

ตาราง 22 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ CPI รูปสมการ intercept

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.859610	0.0002
Test critical values:	1% level	-3.555023	
	5% level	-2.915522	
	10% level	-2.595565	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CPI,2)
Method: Least Squares
Date: 09/21/07 Time: 13:08
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CPI(-1))	-0.626919	0.129006	-4.85961	0

C	0.188971	0.072873	2.593149	0.0123
R-squared	0.308237	Mean dependent var		0.005455
Adjusted R-squared	0.295185	S.D. dependent var		0.550561
S.E. of regression	0.462214	Akaike info criterion		1.330110
Sum squared resid	11.32303	Schwarz criterion		1.403104
Log likelihood	-34.57803	F-statistic		23.615810
Durbin-Watson stat	1.802534	Prob(F-statistic)		0.000011

ตาราง 23 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ CPI รูปสมการ intercept and trend

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.927065	0.0010
Test critical values:	1% level	-4.133838	
	5% level	-3.493692	
	10% level	-3.175693	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CPI,2)
Method: Least Squares
Date: 09/21/07 Time: 13:09
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CPI(-1))	-0.639427	0.129778	-4.927065	0
C	0.083329	0.132568	0.628571	0.5324
@TREND(2002M09)	0.003769	0.00395	0.954294	0.3444
R-squared	0.320143	Mean dependent var		0.005455
Adjusted R-squared	0.293995	S.D. dependent var		0.550561
S.E. of regression	0.462604	Akaike info criterion		1.349112
Sum squared resid	11.12814	Schwarz criterion		1.458603
Log likelihood	-34.10059	F-statistic		12.24334
Durbin-Watson stat	1.810909	Prob(F-statistic)		0.000044

ตาราง 24 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ CPI รูปสมการ none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.908877	0.0002
Test critical values:	1% level	-2.607686	
	5% level	-1.946878	
	10% level	-1.612999	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CPI,2)
Method: Least Squares
Date: 09/21/07 Time: 13:11
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CPI(-1))	-0.453561	0.116034	-3.908877	0.0003
R-squared	0.220469	Mean dependent var		0.005455
Adjusted R-squared	0.220469	S.D. dependent var		0.550561
S.E. of regression	0.486097	Akaike info criterion		1.413196
Sum squared resid	12.75965	Schwarz criterion		1.449693
Log likelihood	-37.86288	Durbin-Watson stat		1.912015

ตาราง 25 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ EXC รูปสมการ intercept

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.548717	0.0000
Test critical values:	1% level	-3.555023	
	5% level	-2.915522	
	10% level	-2.595565	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXC,2)
Method: Least Squares
Date: 09/21/07 Time: 13:15
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXC(-1))	-0.703534	0.126792	-5.548717	0
C	-0.12142	0.071157	-1.706378	0.0938

R-squared	0.367453	Mean dependent var	-0.019879
Adjusted R-squared	0.355518	S.D. dependent var	0.635233
S.E. of regression	0.509963	Akaike info criterion	1.526728
Sum squared resid	13.78329	Schwarz criterion	1.599722
Log likelihood	-39.98503	F-statistic	30.78826
Durbin-Watson stat	1.895866	Prob(F-statistic)	0.000001

ตาราง 26 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ EXC รูปสมการ intercept and trend

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.49321	0.0002
Test critical values:	1% level	-4.133838	
	5% level	-3.493692	
	10% level	-3.175693	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXC,2)
Method: Least Squares
Date: 09/21/07 Time: 13:16
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXC(-1))	-0.70818	0.128919	-5.49321	0
C	-0.085343	0.144487	-0.590664	0.5573
@TREND(2002M09)	-0.001267	0.004404	-0.287708	0.7747

R-squared	0.368458	Mean dependent var	-0.019879
Adjusted R-squared	0.344168	S.D. dependent var	0.635233
S.E. of regression	0.514434	Akaike info criterion	1.561501
Sum squared resid	13.76139	Schwarz criterion	1.670992
Log likelihood	-39.94129	F-statistic	15.1691
Durbin-Watson stat	1.890328	Prob(F-statistic)	0.000006

ตาราง 27 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ EXC รูปสมการ none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.196546	0.0000
Test critical values:	1% level	-2.607686	
	5% level	-1.946878	

	10% level	-1.612999

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXC,2)
Method: Least Squares
Date: 09/21/07 Time: 13:16
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXC(-1))	-0.647892	0.124677	-5.196546	0

R-squared	0.332702	Mean dependent var	-0.019879
Adjusted R-squared	0.332702	S.D. dependent var	0.635233
S.E. of regression	0.518911	Akaike info criterion	1.543847
Sum squared resid	14.54052	Schwarz criterion	1.580344
Log likelihood	-41.45579	Durbin-Watson stat	1.89999

ตาราง 28 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ INT รูปสมการ intercept

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.317975	0.0011
Test critical values:	1% level	-3.555023	
	5% level	-2.915522	
	10% level	-2.595565	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INT,2)
Method: Least Squares
Date: 09/21/07 Time: 13:18
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INT(-1))	-0.465741	0.107861	-4.317975	0.0001
C	0.005604	0.026071	0.214947	0.8306

R-squared	0.26024	Mean dependent var	0.004545
Adjusted R-squared	0.246283	S.D. dependent var	0.222701
S.E. of regression	0.193342	Akaike info criterion	-0.413028
Sum squared resid	1.981197	Schwarz criterion	-0.340034
Log likelihood	13.35826	F-statistic	18.644900
Durbin-Watson stat	1.795486	Prob(F-statistic)	0.000069

ตาราง 29 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ INT รูปสมการ intercept and trend

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.120872	0.0104
Test critical values:	1% level	-4.133838	
	5% level	-3.493692	
	10% level	-3.175693	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INT,2)
Method: Least Squares
Date: 09/21/07 Time: 13:19
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INT(-1))	-0.451125	0.109473	-4.120872	0.0001
C	0.046954	0.054918	0.854996	0.3965
@TREND(2002M09)	-0.001427	0.001667	-0.856135	0.3959
R-squared	0.270523	Mean dependent var		0.004545
Adjusted R-squared	0.242466	S.D. dependent var		0.222701
S.E. of regression	0.193831	Akaike info criterion		-0.390661
Sum squared resid	1.953659	Schwarz criterion		-0.281170
Log likelihood	13.74318	F-statistic		9.641966
Durbin-Watson stat	1.851129	Prob(F-statistic)		0.000274

ตาราง 30 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ INT รูปสมการ none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.354775	0.0000
Test critical values:	1% level	-2.607686	
	5% level	-1.946878	
	10% level	-1.612999	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INT,2)
Method: Least Squares
Date: 09/21/07 Time: 13:20
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INT(-1))	-0.465523	0.106899	-4.354775	0.0001
R-squared	0.259596	Mean dependent var		0.004545
Adjusted R-squared	0.259596	S.D. dependent var		0.222701
S.E. of regression	0.191627	Akaike info criterion		-0.448520
Sum squared resid	1.982924	Schwarz criterion		-0.412023
Log likelihood	13.3343	Durbin-Watson stat		1.794375

ตาราง 31 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ MAI Index รูปสมการ intercept

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.283064	0.0012
Test critical values:	1% level	-3.555023	
	5% level	-2.915522	
	10% level	-2.595565	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MAI_INDEX,2)
Method: Least Squares
Date: 09/21/07 Time: 13:21
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MAI INDEX(-1))	-0.511418	0.119405	-4.283064	0.0001
C	0.860292	2.618435	0.328552	0.7438
R-squared	0.257127	Mean dependent var		-0.191091
Adjusted R-squared	0.243111	S.D. dependent var		22.22235
S.E. of regression	19.33331	Akaike info criterion		8.797222
Sum squared resid	19810.17	Schwarz criterion		8.870216
Log likelihood	-239.9236	F-statistic		18.34464

Durbin-Watson stat	2.015745	Prob(F-statistic)	0.000078

ตาราง 32 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ MAI Index รูปสมการ intercept and trend

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.264523	0.0070
Test critical values:	1% level	-4.133838	
	5% level	-3.493692	
	10% level	-3.175693	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MAI_INDEX,2)
Method: Least Squares
Date: 09/21/07 Time: 13:21
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MAI_INDEX(-1))	-0.517896	0.121443	-4.264523	0.0001
C	2.814214	5.545329	0.507493	0.614
@TREND(2002M09)	-0.066917	0.167023	-0.400649	0.6903

R-squared	0.259413	Mean dependent var	-0.191091
Adjusted R-squared	0.230929	S.D. dependent var	22.22235
S.E. of regression	19.48826	Akaike info criterion	8.830503
Sum squared resid	19749.21	Schwarz criterion	8.939994
Log likelihood	-239.8388	F-statistic	9.107296
Durbin-Watson stat	2.008461	Prob(F-statistic)	0.000406

ตาราง 33 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ MAI Index รูปสมการ none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.306794	0.0000
Test critical values:	1% level	-2.607686	
	5% level	-1.946878	
	10% level	-1.612999	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MAI_INDEX,2)
Method: Least Squares
Date: 09/21/07 Time: 13:22
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MAI_INDEX(-1))	-0.507741	0.117893	-4.306794	0.0001

R-squared	0.255614	Mean dependent var	-0.191091
Adjusted R-squared	0.255614	S.D. dependent var	22.222350
S.E. of regression	19.17296	Akaike info criterion	8.762893
Sum squared resid	19850.52	Schwarz criterion	8.799390
Log likelihood	-239.9796	Durbin-Watson stat	2.019223

ตาราง 34 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ SET Index รูปสมการ intercept

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.570043	0.0000
Test critical values:	1% level	-3.555023	

	5% level	-2.915522
	10% level	-2.595565

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SET_INDEX,2)
Method: Least Squares
Date: 09/21/07 Time: 13:23
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SET_INDEX(-1))	-1.043746	0.137878	-7.570043	0
C	7.204563	4.925964	1.462569	0.1495

R-squared	0.519516	Mean dependent var	0.232909
Adjusted R-squared	0.510451	S.D. dependent var	51.29186
S.E. of regression	35.88779	Akaike info criterion	10.03436
Sum squared resid	68260.46	Schwarz criterion	10.10735
Log likelihood	-273.9448	F-statistic	57.30555
Durbin-Watson stat	1.974359	Prob(F-statistic)	0

ตาราง 35 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ SET Index รูปสมการ intercept and trend

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.682679	0.0000
Test critical values:	1% level	-4.133838	
	5% level	-3.493692	
	10% level	-3.175693	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SET_INDEX,2)
Method: Least Squares
Date: 09/21/07 Time: 13:23
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SET_INDEX(-1))	-1.076118	0.140071	-7.682679	0
C	18.03339	10.39516	1.734787	0.0887
@TREND(2002M09)	-0.365952	0.309682	-1.181702	0.2427

R-squared	0.532082	Mean dependent var	0.232909
Adjusted R-squared	0.514085	S.D. dependent var	51.291860
S.E. of regression	35.75432	Akaike info criterion	10.044220
Sum squared resid	66475.32	Schwarz criterion	10.153710
Log likelihood	-273.2161	F-statistic	29.565300
Durbin-Watson stat	1.955344	Prob(F-statistic)	0

ตาราง 36 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ SET Index รูปสมการ none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.350445	0.0000
Test critical values:	1% level	-2.607686	
	5% level	-1.946878	
	10% level	-1.612999	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SET_INDEX,2)

Method: Least Squares
Date: 09/21/07 Time: 13:24
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SET_INDEX(-1))	-1.006044	0.136869	-7.350445	0

R-squared	0.500124	Mean dependent var	0.232909
Adjusted R-squared	0.500124	S.D. dependent var	51.29186
S.E. of regression	36.26433	Akaike info criterion	10.03756
Sum squared resid	71015.49	Schwarz criterion	10.07406
Log likelihood	-275.0329	Durbin-Watson stat	1.982058

ตาราง 37 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ TVAL รูปสมการ intercept

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.093864	0.0000
Test critical values:	1% level	-3.555023	
	5% level	-2.915522	
	10% level	-2.595565	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TVAL,2)
Method: Least Squares
Date: 09/21/07 Time: 13:27
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TVAL(-1))	-0.974423	0.137361	-7.093864	0
C	55488205	2.49E+08	0.222433	0.8248

R-squared	0.487045	Mean dependent var	1825347
Adjusted R-squared	0.477367	S.D. dependent var	2.56E+09
S.E. of regression	1.85E+09	Akaike info criterion	45.5496
Sum squared resid	1.81E+20	Schwarz criterion	45.62259
Log likelihood	-1250.614	F-statistic	50.32291
Durbin-Watson stat	1.940885	Prob(F-statistic)	0.00000

ตาราง 38 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ TVAL รูปสมการ intercept and trend

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.025024	0.0000
Test critical values:	1% level	-4.133838	
	5% level	-3.493692	
	10% level	-3.175693	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TVAL,2)
Method: Least Squares
Date: 09/21/07 Time: 13:28
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TVAL(-1))	-0.974393	0.138703	-7.025024	0.0000
C	50373245	5.25E+08	0.096035	0.9239
@TREND(2002M09)	176319.8	15860722	0.011117	0.9912

R-squared	0.487046	Mean dependent var	1825347

Adjusted R-squared	0.467317	S.D. dependent var	2.56E+09
S.E. of regression	1.87E+09	Akaike info criterion	45.58596
Sum squared resid	1.81E+20	Schwarz criterion	45.69545
Log likelihood	-1250.614	F-statistic	24.68683
Durbin-Watson stat	1.940949	Prob(F-statistic)	0.00000

ตาราง 39 ก ผลการทดสอบ unit root ที่ระดับ level, I(I) ของ TVAL รูปสมการ none

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.153619	0.0000
Test critical values:	1% level	-2.607686	
	5% level	-1.946878	
	10% level	-1.612999	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TVAL,2)
Method: Least Squares
Date: 09/21/07 Time: 13:28
Sample (adjusted): 2002M11 2007M05
Included observations: 55 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TVAL(-1))	-0.973497	0.136085	-7.153619	0

R-squared	0.486566	Mean dependent var	1825347
Adjusted R-squared	0.486566	S.D. dependent var	2.56E+09
S.E. of regression	1.83E+09	Akaike info criterion	45.51417
Sum squared resid	1.81E+20	Schwarz criterion	45.55066
Log likelihood	-1250.64	Durbin-Watson stat	1.940694

ภาคผนวก ข

ผลการทดสอบ cointegration โดยวิธี Johansen and Juselius

ตาราง 1 ข ผลการทดสอบหา lag length โดยวิธี Test Statistics and Choice Criteria for Selecting the Order of the VAR Model

Test Statistics and Choice Criteria for Selecting the Order of the VAR Model

****

Based on 51 observations from 7 to 57. Order of VAR = 6

List of variables included in the unrestricted VAR:

MAI TVAL EXC CPI SET

INT

****

Order	LL	AIC	SBC	LR test	Adjusted LR test
6	-1408.9	-1624.9	-1833.6	------	------
5	-1486.3	-1666.3	-1840.1	CHSQ(36)= 154.6741[.000]	45.4924[.133]
4	-1546.8	-1690.8	-1829.9	CHSQ(72)= 275.8012[.000]	81.1180[.216]
3	-1589.5	-1697.5	-1801.8	CHSQ(108)= 361.1570[.000]	106.2227[.530]
2	-1620.0	-1692.0	-1761.6	CHSQ(144)= 422.1947[.000]	124.1749[.882]
1	-1661.4	-1697.4	-1732.2	CHSQ(180)= 505.0576[.000]	148.5463[.958]
0	-2232.9	-2232.9	-2232.9	CHSQ(216)= 1647.9[.000]	484.6798[.000]

****

AIC=Akaike Information Criterion SBC=Schwarz Bayesian Criterion

ตาราง 2 ข Cointegration with Restricted Intercepts and No Trends in the VAR

Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix

****

51 observations from 7 to 57. Order of VAR = 6.

List of variables included in the cointegrating vector:

MAI TVAL EXC CPI SET INT Intercept

List of eigenvalues in descending order:

.76435 .74135 .54386 .35310 .18200 .074438 .0000

****

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r = 1	73.7161	40.5300	37.6500
r<= 1	r = 2	68.9668	34.4000	31.7300
r<= 2	r = 3	40.0325	28.2700	25.8000
r<= 3	r = 4	22.2139	22.0400	19.8600
r<= 4	**r = 5**	**10.2456**	**15.8700**	**13.8100**
r<= 5	r = 6	3.9451	9.1600	7.5300

****

Use the above table to determine r (the number of cointegrating vectors).

Cointegration with restricted intercepts and no trends in the VAR

Cointegration LR Test Based on Trace of the Stochastic Matrix

****

51 observations from 7 to 57. Order of VAR = 6.

List of variables included in the cointegrating vector:

MAI TVAL EXC CPI SET INT Intercept

List of eigenvalues in descending order:

.76435 .74135 .54386 .35310 .18200 .074438 .0000

****

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r>= 1	219.1200	102.5600	97.8700
r<= 1	r>= 2	145.4039	75.9800	71.8100
r<= 2	r>= 3	76.4370	53.4800	49.9500
r<= 3	r>= 4	36.4045	34.8700	31.9300
r<= 4	**r>= 5**	**14.1906**	**20.1800**	**17.8800**
r<= 5	r = 6	3.9451	9.1600	7.5300

****

Use the above table to determine r (the number of cointegrating vectors).

Cointegration with restricted intercepts and no trends in the VAR

Choice of the Number of Cointegrating Relations Using Model Selection Criteria

****

51 observations from 7 to 57. Order of VAR = 6.

List of variables included in the cointegrating vector:

MAI TVAL EXC CPI SET

INT Intercept

List of eigenvalues in descending order:

.76435 .74135 .54386 .35310 .18200 .074438 .0000

****

Rank	Maximized LL	AIC	SBC	HQC
r = 0	-1533.2	-1713.2	-1887.0	-1779.6
r = 1	-1496.3	-1688.3	-1873.8	-1759.2
r = 2	-1461.8	-1663.8	-1858.9	-1738.4
r = 3	-1441.8	-1651.8	-1854.6	-1729.3
r = 4	-1430.7	-1646.7	-1855.3	-1726.4
r = 5	-1425.6	-1645.6	-1858.1	-1726.8
r = 6	-1423.6	-1645.6	-1860.0	-1727.5

****

AIC = Akaike Information Criterion SBC = Schwarz Bayesian Criterion

HQC = Hannan-Quinn Criterion

ตาราง 3 ข Cointegration with Unrestricted Intercepts and Restricted Trends in the VAR

Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix

****

51 observations from 7 to 57. Order of VAR = 6.

List of variables included in the cointegrating vector:

MAI TVAL EXC CPI SET INT Trend

List of eigenvalues in descending order:

.82000 .75870 .54986 .53021 .15530 .051027 .0000

****

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r = 1	87.4554	43.6100	40.7600
r<= 1	r = 2	72.5068	37.8600	35.0400
r<= 2	r = 3	40.7079	31.7900	29.1300
r<= 3	r = 4	38.5292	25.4200	23.1000
r<= 4	**r = 5**	**8.6076**	**19.2200**	**17.1800**
r<= 5	r = 6	2.6711	12.3900	10.5500

****

Use the above table to determine r (the number of cointegrating vectors).

Cointegration with unrestricted intercepts and restricted trends in the VAR

Cointegration LR Test Based on Trace of the Stochastic Matrix

****

51 observations from 7 to 57. Order of VAR = 6.

List of variables included in the cointegrating vector:

MAI TVAL EXC CPI SET INT Trend

List of eigenvalues in descending order:

.82000 .75870 .54986 .53021 .15530 .051027 .0000

****

Null	Alternative	Statistic	95% Critical Value	90% Critical Value
r = 0	r>= 1	250.4781	115.8500	110.6000
r<= 1	r>= 2	163.0226	87.1700	82.8800
r<= 2	r>= 3	90.5158	63.0000	59.1600
r<= 3	r>= 4	49.8079	42.3400	39.3400
r<= 4	**r>= 5**	**11.2787**	**25.7700**	**23.0800**
r<= 5	r = 6	2.6711	12.3900	10.5500

****

Use the above table to determine r (the number of cointegrating vectors).

Cointegration with unrestricted intercepts and restricted trends in the VAR

Choice of the Number of Cointegrating Relations Using Model Selection Criteria

****

51 observations from 7 to 57. Order of VAR = 6.

List of variables included in the cointegrating vector:

MAI TVAL EXC CPI SET

INT Trend

List of eigenvalues in descending order:

.82000 .75870 .54986 .53021 .15530 .051027 .0000

****

Rank	Maximized LL	AIC	SBC	HQC
r = 0	-1519.9	-1705.9	-1885.6	-1774.6
r = 1	-1476.2	-1674.2	-1865.4	-1747.3
r = 2	-1439.9	-1647.9	-1848.8	-1724.7
r = 3	-1419.6	-1635.6	-1844.2	-1715.3
r = 4	-1400.3	-1622.3	-1836.7	-1704.2
r = 5	-1396.0	**-1622.0**	-1840.3	-1705.4
r = 6	-1394.7	-1622.7	-1842.9	-1706.8

****

AIC = Akaike Information Criterion SBC = Schwarz Bayesian Criterion

HQC = Hannan-Quinn Criterion

ตาราง 5 ข Estimated Cointegrated Vectors in Johansen Estimation (Normalized in Brackets)

Cointegration with unrestricted intercepts and restricted trends in the VAR

****

51 observations from 7 to 57. Order of VAR = 6, chosen r =4.

List of variables included in the cointegrating vector:

MAI TVAL EXC CPI SET INT Trend

****

	Vector 1	Vector 2	Vector 3	Vector 4
MAI	-.0087726	-.0077516	-.0062823	.0098600
	(-1.0000)	(-1.0000)	(-1.0000)	(-1.0000)
TVAL	.2209E-9	-.2357E-9	.0000	-.1666E-9
	(.2518E-7)	(-.3041E-7)	(.3968E-8)	(.1690E-7)
EXC	-.18654	-.087748	.39858	.43525
	(-21.2638)	(-11.3200)	(63.4449)	(-44.1427)
CPI	.27447	-.25789	.36424	-.31951
	(31.2874)	(-33.2688)	(57.9790)	(32.4045)
SET	.0089133	.0060918	.0098646	-.0066886
	(1.0160)	(.78587)	(1.5702)	(.67835)
INT	-.6192E-5	.2053E-5	.2532E-4	-.2148E-4
	(-.7058E-3)	(.2649E-3)	(.0040305)	(.0021782)
Trend	-.18620	.043424	-.13121	.19313
	(-21.2253)	(5.6019)	(-20.8865)	(-19.5877)

****

Restricted Cointegrated Vectors in Johansen Estimation(Normalized in Brackets)

Cointegration with unrestricted intercepts and restricted trends in the VAR

****

51 observations from 7 to 57. Order of VAR = 6, chosen r =4.

List of variables included in the cointegrating vector:

MAI TVAL EXC CPI SET INT Trend

****

List of imposed restriction(s) on cointegrating vectors:

1 -.00000002518 21.2638 -31.2874 -1.0160 .0007058 21.2253;1 -.00000003014 11.3

200 33.2688 -.78587 -.0002649 -5.6019;1 -.000000003968 -63.4449 -57.9790 -1.57

02 -.0040305 20.8865;1 -.0000001690 44.1427 -32.4045 -.67835 -.0021782 19.5877

****

	Vector 1	Vector 2	Vector 3	Vector 4
MAI	1.0000	1.0000	1.0000	1.0000
TVAL	-.2518E-7	-.3014E-7	-.3968E-8	-.1690E-6
EXC	21.2638	11.3200	-63.4449	44.1427
CPI	-31.2874	33.2688	-57.9790	-32.4045
SET	-1.0160	-.78587	-1.5702	-.67835
INT	.7058E-3	-.2649E-3	-.0040305	-.0021782
Trend	21.2253	-5.6019	20.8865	19.5877

****

LR Test of Restrictions CHSQ(12)= 31.7703[.002]

****

ภาคผนวก ค

Akaike Information Criterion (AIC)

Akaike Information Criterion (AIC) คือ ค่าที่ใช้เป็นเกณฑ์ในการเลือก Lag ที่มีความเหมาะสมกับแบบจำลองมากที่สุด (Hall and Others, 1994) มีสมการดังนี้

$$\text{Akaike Information Criterion (AIC)} = -\frac{2l}{n}+\frac{2k}{n} \quad (1)$$

โดยที่ k คือ จำนวน Parameter ที่ถูกประมาณค่า

n คือ จำนวน Usabel Observation

l คือ ค่า Log Likelihood Function ที่มี k Parameter และมีสมการเป็น

$$l = -\frac{nm}{2}(1+\log 2\pi)-\frac{n}{2}\log\left|\hat{\Omega}\right| \quad (2)$$

โดย

$$\left|\hat{\Omega}\right| = \det\left(\sum \hat{\varepsilon}\hat{\varepsilon}'/n\right) \quad (3)$$

และ m คือ จำนวนสมการ

จากสมการที่ 1 ค่า Akaike Information Criterion (AIC) เป็นฟังก์ชันของจำนวน k จำนวน n และค่า l จากสมการที่ 2 ค่า l มีความสัมพันธ์กับค่า Sum of Squared Residual $\left(\sum \hat{\varepsilon}\hat{\varepsilon}'\right)$ ในสมการที่ 3 และจากความสัมพันธ์ดังกล่าวจึงสรุปได้ว่า ค่า Akaike Information Criterion (AIC) มีความสัมพันธ์กับค่า Sum of Squared Residual (RSS) ในทิศทางเดียวกัน นั่นคือ เมื่อค่า Sum of Squared Residual (RSS) มาก[น้อย] จะทำให้ค่า Akaike Infirmatiion Criterion (AIC) มาก[น้อย] ตามไปด้วย จากลักษณะดังกล่าวจึงได้นำค่า AIC มาใช้เป็นเกณฑ์ในการเลือกจำนวน Lag ที่มีความเหมาะสมกับแบบจำลองมากที่สุด เนื่องจากการเพิ่ม[ลด]จำนวน Lag ในแบบจำลองจะมีความสัมพันธ์กับจำนวน k จำนวน n และค่า Sum of Squared Residual (RSS) โดยทำให้จำนวน k เพิ่ม[ลดลง] และทำให้สูญเสียจำนวน n มากขึ้น[น้อยลง] รวมถึงค่า Sum of Squared Residual (RSS) สูงต่ำแตกต่างกัน เกณฑ์ในการเลือกจำนวน Lag ที่เหมาะสมกับแบบจำลองมากที่สุดจะพิจารณาจากจำนวน Lag ที่ให้ค่า AIC ต่ำที่สุด เพราะมีค่า Sum of Squared Residual (RSS) ต่ำสุดด้วย ซึ่งหมายความว่าแบบจำลองที่มี Lag ที่ให้ค่า AIC ต่ำที่สุดนั้นมีค่าความคลาดเคลื่อนต่ำสุด

ภาคผนวก ง

ผลการทดสอบ Errror Correction Model

ตาราง 1 ง ผลการปรับตัวในระยะสั้น

ECM for variable MAI estimated by OLS based on cointegrating VAR(6)

****

Dependent variable is dMAI

51 observations used for estimation from 7 to 57

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
Intercept	-923.2112	1051.8	-.87773[.393]
dMAI1	-.38207	.28980	-1.3184[.206]
dTVAL1	.1204E-7	.4716E-8	2.5529[.021]
dEXC1	-29.2323	10.5156	-2.7799[.013]
dCPI1	9.3560	11.1805	.83682[.415]
dSET1	.15701	.26917	.58332[.568]
dINT1	-17.1192	23.7081	-.72208[.481]
dMAI2	-.36069	.29089	-1.2399[.233]
dTVAL2	.1096E-7	.3875E-8	2.8291[.012]
dEXC2	-20.8727	9.9279	-2.1024[.052]
dCPI2	-2.9216	7.8820	-.37067[.716]
dSET2	.20213	.26448	.76428[.456]
dINT2	-33.5395	25.5418	-1.3131[.208]
dMAI3	-.15933	.27686	-.57551[.573]
dTVAL3	.6045E-8	.3163E-8	1.9109[.074]
dEXC3	-15.9223	9.2782	-1.7161[.105]
dCPI3	20.5382	9.6802	2.1217[.050]
dSET3	.20234	.18719	1.0809[.296]
dINT3	-99.4030	32.3067	-3.0769[.007]
dMAI4	-.25884	.32888	-.78706[.443]

dTVAL4	.5014E-8	.2656E-8	1.8881[.077]
dEXC4	-22.4886	8.8653	-2.5367[.022]
dCPI4	23.0233	9.9108	2.3231[.034]
dSET4	.23371	.13995	1.6699[.114]
dINT4	-110.0949	35.1469	-3.1324[.006]
dMAI5	-.0039437	.29470	-.013382[.989]
dTVAL5	.2943E-8	.3112E-8	.94590[.358]
dEXC5	-13.7690	8.2196	-1.6752[.113]
dCPI5	2.4454	10.5050	.23278[.819]
dSET5	.084516	.10516	.80369[.433]
dINT5	-89.9557	27.7231	-3.2448[.005]
ecm1(-1)	**.58706**	**.14894**	**3.9416[.001]**
ecm2(-1)	-.12660	.11781	-1.0747[.298]
ecm3(-1)	-.32090	.10649	-3.0135[.008]
ecm4(-1)	.038693	.045079	.85835[.403]

****

List of additional temporary variables created:

dMAI = MAI-MAI(-1)
dMAI1 = MAI(-1)-MAI(-2)
dTVAL1 = TVAL(-1)-TVAL(-2)
dEXC1 = EXC(-1)-EXC(-2)
dCPI1 = CPI(-1)-CPI(-2)
dSET1 = SET(-1)-SET(-2)
dINT1 = INT(-1)-INT(-2)
dMAI2 = MAI(-2)-MAI(-3)
dTVAL2 = TVAL(-2)-TVAL(-3)
dEXC2 = EXC(-2)-EXC(-3)
dCPI2 = CPI(-2)-CPI(-3)
dSET2 = SET(-2)-SET(-3)
dINT2 = INT(-2)-INT(-3)
dMAI3 = MAI(-3)-MAI(-4)
dTVAL3 = TVAL(-3)-TVAL(-4)
dEXC3 = EXC(-3)-EXC(-4)
dCPI3 = CPI(-3)-CPI(-4)
dSET3 = SET(-3)-SET(-4)
dINT3 = INT(-3)-INT(-4)
dMAI4 = MAI(-4)-MAI(-5)
dTVAL4 = TVAL(-4)-TVAL(-5)
dEXC4 = EXC(-4)-EXC(-5)
dCPI4 = CPI(-4)-CPI(-5)
dSET4 = SET(-4)-SET(-5)
dINT4 = INT(-4)-INT(-5)
dMAI5 = MAI(-5)-MAI(-6)
dTVAL5 = TVAL(-5)-TVAL(-6)
dEXC5 = EXC(-5)-EXC(-6)
dCPI5 = CPI(-5)-CPI(-6)
dSET5 = SET(-5)-SET(-6)
dINT5 = INT(-5)-INT(-6)

ecm1 = 1.0000*MAI -.2518E-7*TVAL + 21.2638*EXC -31.2874*CPI -1.0160*SET + .7058E-3*INT + 21.2253*Trend;

ecm2 = 1.0000*MAI -.3014E-7*TVAL + 11.3200*EXC + 33.2688*CPI -.78587*SET -.2649E-3*INT - 5.6019*Trend;

ecm3 = 1.0000*MAI -.3968E-8*TVAL -63.4449*EXC -57.9790*CPI -1.5702*SET -.0040305*INT + 20.8865*Trend;

ecm4 = 1.0000*MAI -.1690E-6*TVAL + 44.1427*EXC -32.4045*CPI -.67835*SET -.0021782*INT + 19.5877*Trend

****

R-Squared	.85071	R-Bar-Squared	.53347
S.E. of Regression	15.1997	F-stat. F(34, 16)	2.6816[.019]
Mean of Dependent Variable	1.5486	S.D. of Dependent Variable	22.2534
Residual Sum of Squares	3696.5	Equation Log-likelihood	-181.5903
Akaike Info. Criterion	-216.5903	Schwarz Bayesian Criterion	-250.3973
DW-statistic	2.1859	System Log-likelihood	-1416.2

****

Diagnostic Tests

****

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= 4.1912[.041]	F(1, 15)= 1.3431[.265]
B:Functional Form	CHSQ(1)= 14.7071[.000]	F(1, 15)= 6.0785[.026]
C:Normality	CHSQ(2)= 1.1566[.561]	Not applicable
D:Heteroscedasticity	CHSQ(1)= 5.9803[.014]	F(1, 49)= 6.5091[.014]

****

A:Lagrange multiplier test of residual serial correlation

B:Ramsey's RESET test using the square of the fitted values

C:Based on a test of skewness and kurtosis of residuals

D:Based on the regression of squared residuals on squared fitted values

ประวัติผู้เขียน

ชื่อ	นางสาวศิริรัตน์ ใจสมิง
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ประวัติการศึกษา	สำเร็จการศึกษาระดับมัธยมตอนต้น โรงเรียนดาราวิทยาลัย ปีการศึกษา 2531 สำเร็จการศึกษาระดับมัธยมตอนปลาย โรงเรียนดาราวิทยาลัย ปีการศึกษา 2534 สำเร็จการศึกษาระดับปริญญาตรีวิทยาศาสตรบัณฑิต สาขาวัสดุศาสตร์ มหาวิทยาลัยเชียงใหม่ ปีการศึกษา 2539