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ภาคผนวก ก

มูลค่าการส่งออกปลาทุ่นกระป๋อง

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มูลค่าการส่งออกปลาหูฉลามกระป๋องของไทย ตั้งแต่เดือน มกราคม พ.ศ. 2534 ถึงเดือน พฤษภาคม พ.ศ. 2549 (CTN)

หน่วย: บาท

เดือน ปี	มกราคม	กุมภาพันธ์	มีนาคม	เมษายน	พฤษภาคม	มิถุนายน	กรกฎาคม	สิงหาคม	กันยายน	ตุลาคม	พฤศจิกายน	ธันวาคม
2534	1,128,857,955	1,044,303,953	1,710,533,591	1,406,351,865	1,266,125,722	1,110,117,697	1,818,300,735	1,517,629,232	1,451,203,729	1,251,974,165	1,516,495,510	908,883,638
2535	825,684,853	868,095,051	1,289,083,920	1,160,864,718	1,098,410,170	1,113,222,485	1,059,575,148	1,090,525,795	1,184,463,598	1,295,526,186	1,327,720,834	1,124,966,330
2536	778,310,263	894,886,840	873,124,369	956,458,194	1,098,031,938	1,166,487,008	1,152,260,216	957,856,693	1,219,795,837	1,280,886,938	1,278,498,375	1,406,179,898
2537	1,255,615,659	1,118,813,717	1,447,626,095	1,073,392,224	1,306,940,099	1,338,489,325	1,066,234,506	1,257,623,452	1,305,491,627	1,454,174,770	1,608,221,427	1,387,075,334
2538	1,181,193,979	1,143,575,101	1,323,917,927	1,113,127,563	1,248,297,662	1,228,469,493	1,007,403,285	1,022,102,899	1,004,407,215	1,140,632,421	1,133,069,956	1,083,175,868
2539	987,947,372	969,650,395	964,395,664	1,012,424,512	1,137,521,613	1,005,936,805	972,862,122	1,028,313,964	923,559,405	1,009,373,881	1,267,594,109	1,103,278,927
2540	1,341,148,130	1,027,811,448	1,164,982,539	928,835,211	956,106,765	984,076,314	1,301,279,249	1,232,960,148	1,684,417,929	1,946,687,316	2,159,765,890	2,119,471,019
2541	2,445,731,734	2,561,443,765	2,258,160,617	1,739,649,603	1,949,763,165	2,155,671,336	2,110,601,754	1,983,641,200	1,872,587,397	1,925,683,737	2,322,766,499	1,850,532,188
2542	1,423,153,315	1,720,450,955	2,056,925,617	1,927,924,144	1,621,903,350	1,692,166,900	1,662,573,010	1,764,330,447	1,961,148,747	1,976,318,422	2,213,857,863	1,861,795,365
2543	1,338,880,392	1,462,233,470	1,510,879,921	1,568,638,873	1,078,356,773	1,469,186,148	1,521,282,308	1,633,833,952	1,604,835,244	1,876,741,848	1,899,867,760	1,734,237,770
2544	1,550,716,924	1,718,629,450	1,828,436,636	1,855,391,408	2,228,359,258	2,147,855,387	2,239,657,553	2,510,943,649	2,303,084,405	2,615,364,224	2,885,705,312	1,823,248,355
2545	1,655,049,727	1,594,114,859	2,091,087,418	1,719,677,765	1,781,500,902	2,109,188,976	2,088,727,940	1,807,163,583	1,967,101,323	2,341,122,799	2,929,343,114	2,003,059,595
2546	2,213,340,412	2,600,532,513	2,445,648,071	2,439,187,211	2,489,252,519	2,303,174,080	2,229,386,625	2,263,917,629	2,251,345,959	2,218,326,167	2,281,714,853	1,863,893,292
2547	2,002,110,799	2,315,996,216	2,271,881,302	1,934,237,334	2,300,381,877	2,479,482,354	2,559,295,495	2,509,937,151	2,707,313,976	2,663,148,815	2,993,739,514	2,471,320,760
2548	2,324,186,978	2,298,108,712	2,787,823,379	2,707,747,109	2,902,600,921	3,239,369,802	3,285,864,986	3,495,430,320	3,386,933,565	3,378,352,404	3,450,082,832	3,111,170,383
2549	3,119,754,563	3,097,204,471	3,458,468,945	2,836,459,479	3,781,138,915							

ที่มา: กรมศุลกากร (2549)

มูลค่าการส่งออกปลาพวงน้ำกระป๋องในรูปลอกการที่มาตรฐานธรรมชาติ ตั้งแต่เดือน มกราคม พ.ศ. 2534 ถึงเดือน พฤษภาคม พ.ศ. 2549 (lnCTN_p)

เดือน ปี	มกราคม	กุมภาพันธ์	มีนาคม	เมษายน	พฤษภาคม	มิถุนายน	กรกฎาคม	สิงหาคม	กันยายน	ตุลาคม	พฤศจิกายน	ธันวาคม
2534	20.844472	20.766616	21.260071	21.064265	20.959227	20.827732	21.321168	21.140415	21.095659	20.947987	21.139668	20.627728
2535	20.531724	20.581812	20.977198	20.872431	20.817130	20.830525	20.781134	20.809926	20.892556	20.982183	21.006730	20.841019
2536	20.472636	20.612208	20.587589	20.678748	20.816785	20.877263	20.864991	20.680209	20.921949	20.970819	20.968952	21.064143
2537	20.950892	20.835535	21.093191	20.794090	20.990954	21.014807	20.787399	20.952490	20.989846	21.097704	21.198395	21.050463
2538	20.889792	20.857425	21.003861	20.830440	20.945047	20.929035	20.730642	20.745128	20.727663	20.854849	20.848197	20.803163
2539	20.711140	20.692446	20.687012	20.735614	20.852118	20.729185	20.695753	20.751186	20.643746	20.732596	20.960387	20.821552
2540	21.016792	20.750698	20.875972	20.649442	20.678380	20.707214	20.986614	20.932684	21.244686	21.389395	21.493266	21.474432
2541	21.617610	21.663837	21.537816	21.276950	21.390974	21.491368	21.470239	21.408200	21.350587	21.378547	21.566025	21.338739
2542	21.076141	21.265852	21.444478	21.379710	21.206866	21.249276	21.231632	21.291037	21.396796	21.404502	21.518002	21.344807
2543	21.015100	21.103231	21.135958	21.173474	20.798704	21.107974	21.142819	21.214195	21.196287	21.352803	21.365050	21.273834
2544	21.161983	21.264793	21.326727	21.341362	21.524531	21.487736	21.529589	21.643924	21.557515	21.684669	21.783035	21.323886
2545	21.227097	21.189584	21.460950	21.265403	21.300722	21.469569	21.459821	21.315024	21.399827	21.573896	21.798044	21.417942
2546	21.517769	21.678982	21.617576	21.614931	21.635248	21.557554	21.524992	21.540363	21.534794	21.520019	21.548193	21.345933
2547	21.417468	21.563106	21.543874	21.382979	21.556341	21.631316	21.662998	21.643524	21.719223	21.702775	21.819789	21.628019
2548	21.566636	21.555352	21.748527	21.719383	21.788873	21.898645	21.912896	21.974722	21.943191	21.940654	21.961664	21.858265
2549	21.861020	21.853766	21.964092	21.765822	22.053291							

ที่มา: จากการคำนวณ



ภาคผนวก ข

ผลการทดสอบความนิ่งของข้อมูล

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ตารางการทดสอบ unit root โดยการทดสอบ Augmented Dickey-Fuller

At level without intercept and trend

ADF Test Statistic	0.824139	1% Critical Value*	-2.5769
		5% Critical Value	-1.9415
		10% Critical Value	-1.6166

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNCTN)

Method: Least Squares

Date: 09/05/06 Time: 21:59

Sample(adjusted): 5 185

Included observations: 181 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCTN(-1)	0.000417	0.000506	0.824139	0.4110
D(LNCTN(-1))	-0.301599	0.073952	-4.078300	0.0001
D(LNCTN(-2))	-0.230424	0.073609	-3.130363	0.0020
D(LNCTN(-3))	-0.211524	0.072267	-2.926976	0.0039
R-squared	0.120850	Mean dependent var		0.005464
Adjusted R-squared	0.105949	S.D. dependent var		0.152402
S.E. of regression	0.144103	Akaike info criterion		-1.014726
Sum squared resid	3.675520	Schwarz criterion		-0.944041
Log likelihood	95.83274	F-statistic		8.110300
Durbin-Watson stat	1.933838	Prob(F-statistic)		0.000043

ที่มา: จากการคำนวณ

ตารางการทดสอบ unit root โดยการทดสอบ Augmented Dickey-Fuller

At level with intercept but without trend

ADF Test Statistic	-0.870246	1% Critical Value*	-3.4676
		5% Critical Value	-2.8775
		10% Critical Value	-2.5752

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNCTN)

Method: Least Squares

Date: 09/05/06 Time: 21:59

Sample(adjusted): 5 185

Included observations: 181 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCTN(-1)	-0.026491	0.030441	-0.870246	0.3854
D(LNCTN(-1))	-0.282310	0.077147	-3.659360	0.0003
D(LNCTN(-2))	-0.215132	0.075659	-2.843449	0.0050
D(LNCTN(-3))	-0.200742	0.073333	-2.737405	0.0068
C	0.570902	0.645761	0.884076	0.3779
R-squared	0.124737	Mean dependent var	0.005464	
Adjusted R-squared	0.104845	S.D. dependent var	0.152402	
S.E. of regression	0.144192	Akaike info criterion	-1.008108	
Sum squared resid	3.659270	Schwarz criterion	-0.919751	
Log likelihood	96.23375	F-statistic	6.270617	
Durbin-Watson stat	1.930160	Prob(F-statistic)	0.000097	

ที่มา: จากการศึกษา

ตารางการทดสอบ unit root โดยการทดสอบ Augmented Dickey-Fuller

At level with intercept and trend

ADF Test Statistic	-3.314847	1% Critical Value*	-4.0114
		5% Critical Value	-3.4355
		10% Critical Value	-3.1415

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNCTN)

Method: Least Squares

Date: 09/05/06 Time: 21:59

Sample(adjusted): 5 185

Included observations: 181 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCTN(-1)	-0.194293	0.058613	-3.314847	0.0011
D(LNCTN(-1))	-0.184320	0.080648	-2.285478	0.0235
D(LNCTN(-2))	-0.135907	0.077374	-1.756503	0.0808
D(LNCTN(-3))	-0.147382	0.073124	-2.015495	0.0454
C	4.007020	1.211394	3.307776	0.0011
@TREND(1)	0.001312	0.000396	3.317332	0.0011
R-squared	0.176521	Mean dependent var	0.005464	
Adjusted R-squared	0.152993	S.D. dependent var	0.152402	
S.E. of regression	0.140260	Akaike info criterion	-1.058044	
Sum squared resid	3.442775	Schwarz criterion	-0.952016	
Log likelihood	101.7530	F-statistic	7.502593	
Durbin-Watson stat	1.927387	Prob(F-statistic)	0.000002	

ที่มา: จากการคำนวณ

ตารางการทดสอบ unit root โดยการทดสอบ Augmented Dickey-Fuller

At first difference without intercept and trend

ADF Test Statistic	-7.523541	1% Critical Value*	-2.5770
		5% Critical Value	-1.9415
		10% Critical Value	-1.6166

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNCTN,2)

Method: Least Squares

Date: 09/05/06 Time: 22:00

Sample(adjusted): 6 185

Included observations: 180 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNCTN(-1))	-1.510847	0.200816	-7.523541	0.0000
D(LNCTN(-1),2)	0.237063	0.162479	1.459039	0.1463
D(LNCTN(-2),2)	0.047906	0.119760	0.400012	0.6896
D(LNCTN(-3),2)	-0.122884	0.073563	-1.670447	0.0966
R-squared	0.642617	Mean dependent var		0.002181
Adjusted R-squared	0.636525	S.D. dependent var		0.238118
S.E. of regression	0.143559	Akaike info criterion		-1.022172
Sum squared resid	3.627207	Schwarz criterion		-0.951218
Log likelihood	95.99552	F-statistic		105.4894
Durbin-Watson stat	1.952382	Prob(F-statistic)		0.000000

ที่มา: จากการคำนวณ

ตารางการทดสอบ unit root โดยการทดสอบ Augmented Dickey-Fuller

At first difference with intercept but without trend

ADF Test Statistic	-7.553855	1% Critical Value*	-3.4678
		5% Critical Value	-2.8776
		10% Critical Value	-2.5752

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNCTN,2)

Method: Least Squares

Date: 09/05/06 Time: 22:00

Sample(adjusted): 6 185

Included observations: 180 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNCTN(-1))	-1.525058	0.201891	-7.553855	0.0000
D(LNCTN(-1),2)	0.248152	0.163301	1.519594	0.1304
D(LNCTN(-2),2)	0.055550	0.120308	0.461729	0.6448
D(LNCTN(-3),2)	-0.119255	0.073799	-1.615949	0.1079
C	0.008293	0.010758	0.770841	0.4418
R-squared	0.643826	Mean dependent var	0.002181	
Adjusted R-squared	0.635685	S.D. dependent var	0.238118	
S.E. of regression	0.143725	Akaike info criterion	-1.014451	
Sum squared resid	3.614933	Schwarz criterion	-0.925758	
Log likelihood	96.30059	F-statistic	79.08317	
Durbin-Watson stat	1.953822	Prob(F-statistic)	0.000000	

ที่มา: จากการศึกษา

ตารางการทดสอบ unit root โดยการทดสอบ Augmented Dickey-Fuller

At first difference with intercept and trend

ADF Test Statistic	-7.579515	1% Critical Value*	-4.0117
		5% Critical Value	-3.4356
		10% Critical Value	-3.1416

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNCTN,2)

Method: Least Squares

Date: 09/05/06 Time: 22:00

Sample(adjusted): 6 185

Included observations: 180 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNCTN(-1))	-1.536829	0.202761	-7.579515	0.0000
D(LNCTN(-1),2)	0.257091	0.163946	1.568142	0.1187
D(LNCTN(-2),2)	0.060336	0.120631	0.500167	0.6176
D(LNCTN(-3),2)	-0.116900	0.073959	-1.580605	0.1158
C	-0.006267	0.022277	-0.281306	0.7788
@TREND(1)	0.000155	0.000207	0.746668	0.4563
R-squared	0.644963	Mean dependent var	0.002181	
Adjusted R-squared	0.634761	S.D. dependent var	0.238118	
S.E. of regression	0.143907	Akaike info criterion	-1.006539	
Sum squared resid	3.603387	Schwarz criterion	-0.900107	
Log likelihood	96.58849	F-statistic	63.21807	
Durbin-Watson stat	1.954975	Prob(F-statistic)	0.000000	

ที่มา: จากการคำนวณ



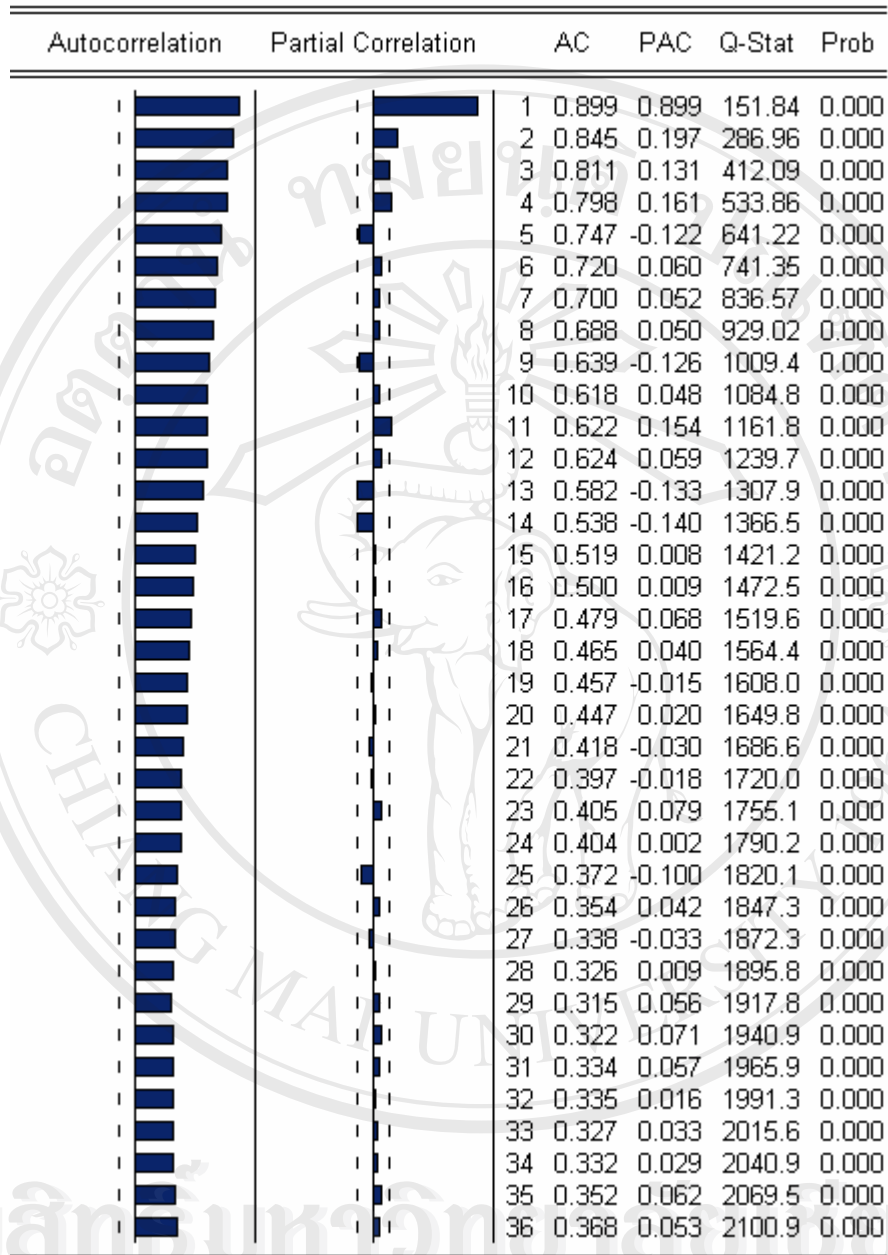
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ผลคอเรลโลแกรม

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Correlogram ของอนุกรมเวลามูลค่าการส่งออกปลาหูกระป๋อง ณ ระดับ Level (lnCTN_t)

ที่มา: จากการคำนวณ

Correlogram ของอนุกรมเวลามูลค่าการส่งออกปลาหูน้ำกระป๋อง ณ ระดับ First difference

($\Delta \ln \text{CTN}$)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	-0.237	-0.237	10.472	0.001
		2	-0.109	-0.175	12.702	0.002
		3	-0.120	-0.209	15.419	0.001
		4	0.209	0.111	23.750	0.000
		5	-0.148	-0.121	27.951	0.000
		6	-0.024	-0.073	28.064	0.000
		7	-0.057	-0.092	28.699	0.000
		8	0.206	0.110	36.984	0.000
		9	-0.176	-0.109	43.060	0.000
		10	-0.128	-0.203	46.276	0.000
		11	-0.026	-0.141	46.415	0.000
		12	0.269	0.106	60.813	0.000
		13	0.025	0.162	60.939	0.000
		14	-0.115	-0.016	63.606	0.000
		15	0.017	0.037	63.668	0.000
		16	0.014	-0.094	63.707	0.000
		17	-0.060	-0.059	64.443	0.000
		18	-0.077	-0.064	65.668	0.000
		19	0.040	0.057	66.008	0.000
		20	0.108	0.016	68.430	0.000
		21	-0.024	0.021	68.548	0.000
		22	-0.177	-0.073	75.160	0.000
		23	0.049	-0.017	75.671	0.000
		24	0.163	0.100	81.381	0.000
		25	0.042	0.046	81.770	0.000
		26	-0.046	-0.003	82.219	0.000
		27	-0.021	-0.097	82.311	0.000
		28	0.033	-0.071	82.555	0.000
		29	-0.090	-0.062	84.327	0.000
		30	-0.068	-0.072	85.366	0.000
		31	0.050	-0.024	85.929	0.000
		32	0.072	-0.070	87.083	0.000
		33	-0.076	-0.086	88.382	0.000
		34	-0.085	-0.106	90.037	0.000
		35	0.025	-0.072	90.184	0.000
		36	0.176	0.049	97.308	0.000

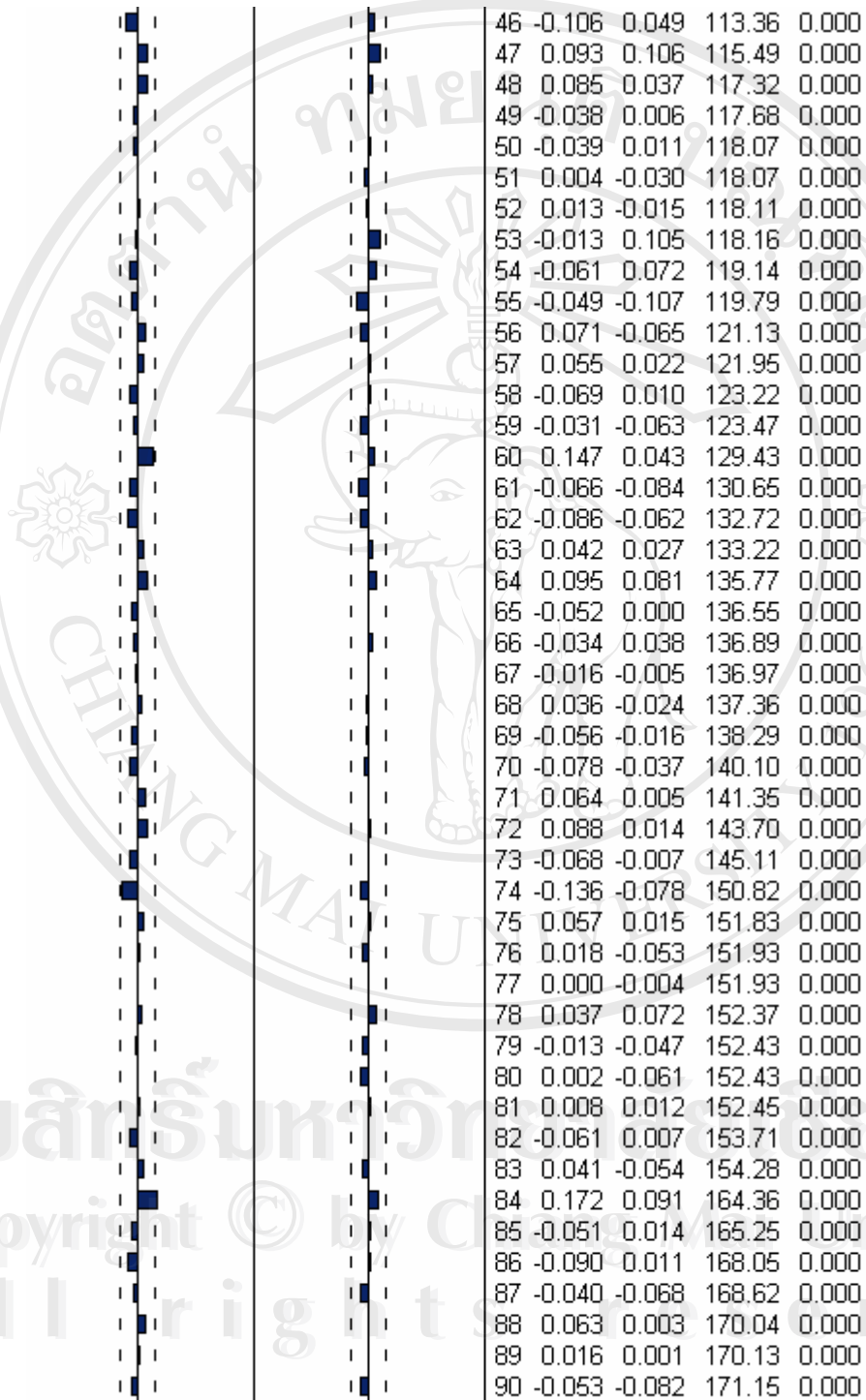
ที่มา: จากการคำนวณ

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Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C AR(1) MA(1)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	-0.128	-0.128	3.0330	
		2	-0.256	-0.276	15.244	
		3	-0.011	-0.097	15.266	0.000
		4	0.115	0.029	17.764	0.000
		5	-0.065	-0.073	18.557	0.000
		6	-0.119	-0.116	21.244	0.000
		7	0.023	-0.050	21.343	0.001
		8	0.155	0.090	25.968	0.000
		9	-0.129	-0.108	29.222	0.000
		10	-0.200	-0.198	37.041	0.000
		11	0.011	-0.141	37.063	0.000
		12	0.269	0.135	51.386	0.000
		13	0.057	0.132	52.023	0.000
		14	-0.144	-0.001	56.176	0.000
		15	0.025	0.018	56.304	0.000
		16	0.012	-0.086	56.334	0.000
		17	-0.065	-0.051	57.196	0.000
		18	-0.094	-0.073	59.009	0.000
		19	0.046	-0.046	59.452	0.000
		20	0.127	0.012	62.780	0.000
		21	-0.029	0.021	62.961	0.000
		22	-0.195	-0.087	70.989	0.000
		23	0.057	0.013	71.677	0.000
		24	0.175	0.078	78.216	0.000
		25	-0.029	-0.022	78.399	0.000
		26	-0.079	-0.026	79.730	0.000
		27	0.000	-0.086	79.730	0.000
		28	0.012	-0.081	79.759	0.000
		29	-0.073	-0.053	80.935	0.000
		30	-0.105	-0.077	83.380	0.000
		31	0.072	-0.026	84.526	0.000
		32	0.072	-0.067	85.691	0.000
		33	-0.074	-0.092	86.913	0.000
		34	-0.121	-0.115	90.227	0.000
		35	0.062	-0.054	91.100	0.000
		36	0.172	0.043	97.895	0.000
		37	0.013	0.048	97.932	0.000
		38	-0.095	-0.049	100.06	0.000
		39	0.028	-0.053	100.24	0.000
		40	0.061	0.007	101.12	0.000
		41	-0.088	-0.039	102.98	0.000
		42	-0.070	-0.016	104.16	0.000
		43	0.091	-0.003	106.17	0.000
		44	0.129	0.042	110.24	0.000
		45	-0.036	0.079	110.56	0.000

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C AR(1) MA(1) (ต่อ)

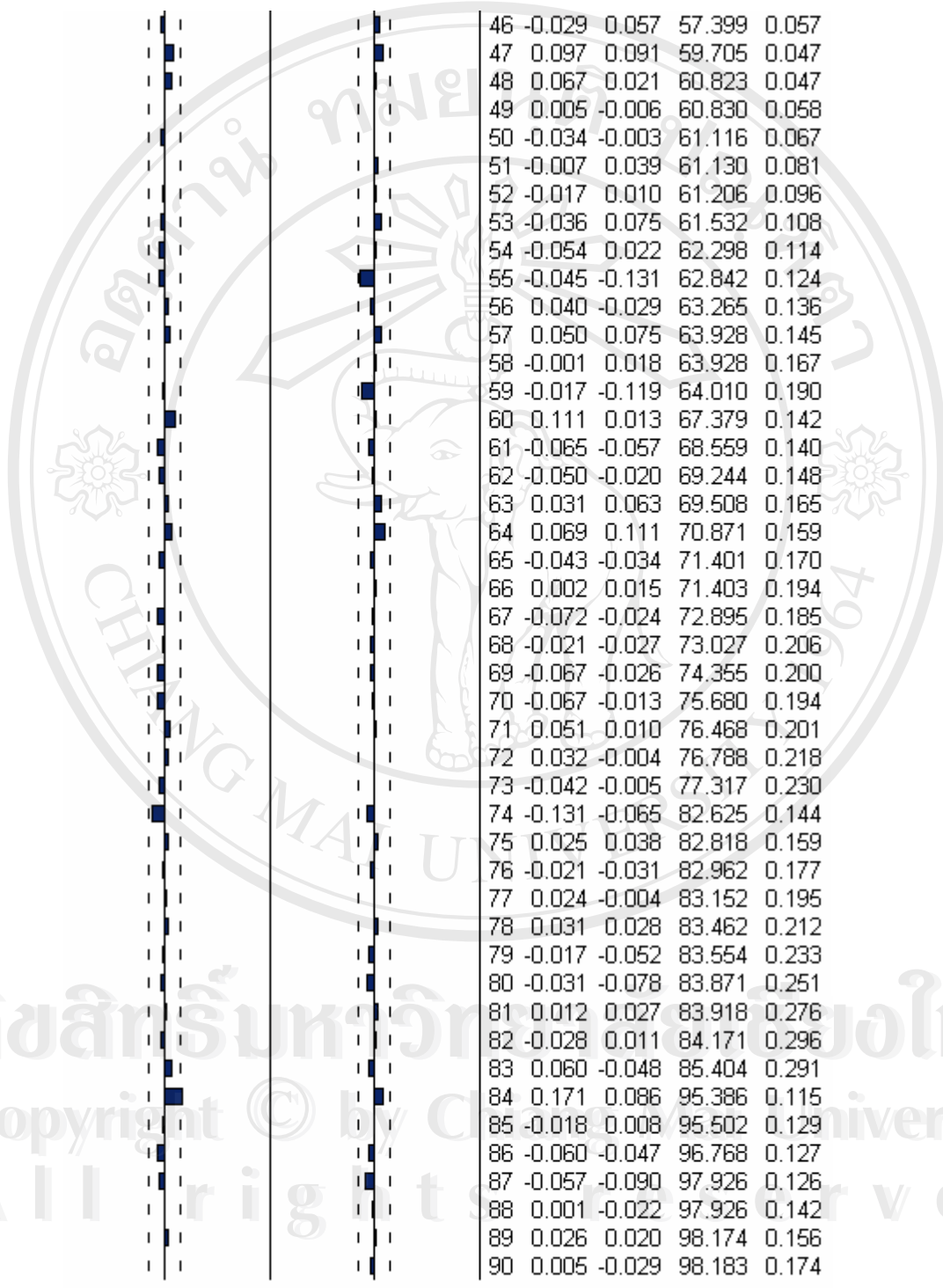


ที่มา: จากการคำนวณ

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C AR(1) AR(2) AR(3) MA(1)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	-0.013	-0.013	0.0324	
		2	0.010	0.010	0.0522	
		3	-0.046	-0.046	0.4479	
		4	-0.085	-0.087	1.8065	
		5	-0.038	-0.040	2.0805	0.149
		6	-0.091	-0.094	3.6626	0.160
		7	-0.002	-0.014	3.6637	0.300
		8	0.037	0.027	3.9243	0.416
		9	-0.110	-0.127	6.2645	0.281
		10	-0.124	-0.153	9.2389	0.161
		11	0.014	0.000	9.2786	0.233
		12	0.202	0.198	17.315	0.027
		13	0.120	0.109	20.153	0.017
		14	-0.078	-0.118	21.375	0.019
		15	0.011	-0.024	21.399	0.029
		16	-0.081	-0.061	22.711	0.030
		17	-0.079	-0.043	23.964	0.031
		18	-0.076	-0.053	25.135	0.033
		19	0.022	-0.005	25.230	0.047
		20	0.056	-0.006	25.870	0.056
		21	0.000	0.018	25.870	0.077
		22	-0.106	-0.057	28.195	0.059
		23	0.044	0.031	28.605	0.072
		24	0.148	0.104	33.240	0.032
		25	-0.017	-0.069	33.305	0.043
		26	-0.045	-0.086	33.740	0.052
		27	-0.067	-0.086	34.707	0.056
		28	-0.063	-0.059	35.572	0.060
		29	-0.085	-0.034	37.132	0.056
		30	-0.120	-0.096	40.315	0.036
		31	0.027	-0.037	40.478	0.046
		32	0.010	-0.081	40.500	0.060
		33	-0.074	-0.113	41.723	0.059
		34	-0.047	-0.058	42.213	0.069
		35	0.066	0.024	43.213	0.071
		36	0.154	0.044	48.651	0.030
		37	0.089	0.045	50.482	0.026
		38	-0.047	-0.068	50.998	0.031
		39	0.006	-0.037	51.007	0.039
		40	0.020	0.063	51.101	0.049
		41	-0.087	-0.027	52.901	0.044
		42	-0.018	-0.001	52.976	0.054
		43	0.073	0.034	54.240	0.053
		44	0.107	0.065	56.999	0.040
		45	0.028	0.091	57.193	0.048

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C AR(1) AR(2) AR(3) MA(1) (ต่อ)



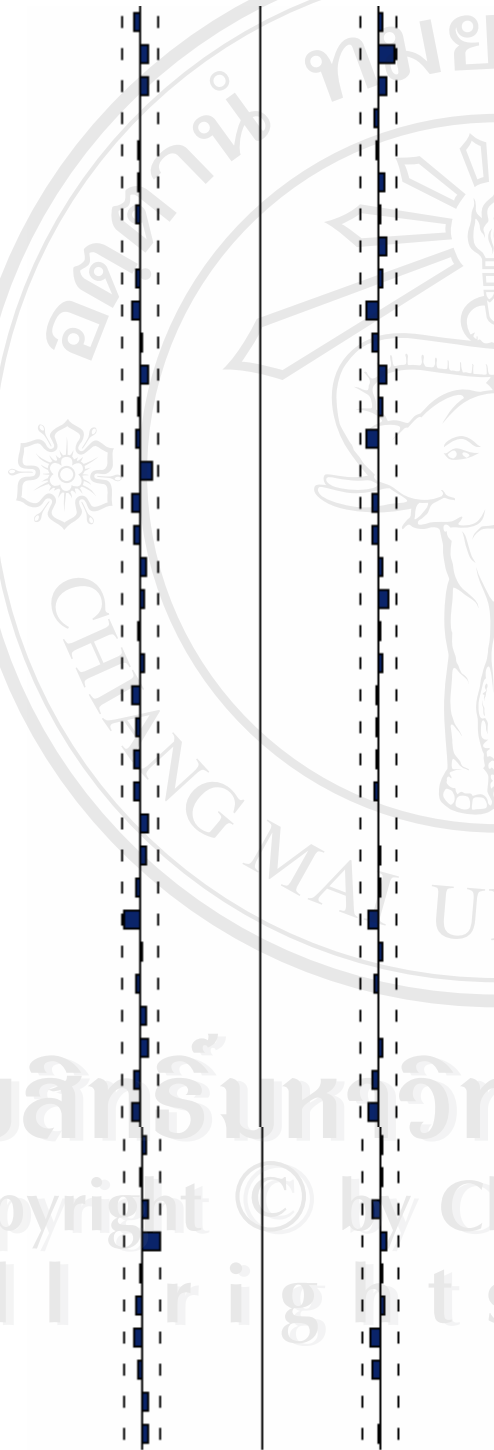
ที่มา: จากการคำนวณ

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C AR(1) AR(2) AR(3) MA(1) MA(2)

MA(3)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	-0.055	-0.055	0.5578	
		2	-0.075	-0.078	1.5949	
		3	-0.082	-0.092	2.8498	
		4	-0.152	-0.171	7.1544	
		5	0.003	-0.036	7.1565	
		6	0.059	0.021	7.8179	
		7	-0.008	-0.035	7.8295	0.005
		8	-0.019	-0.046	7.9000	0.019
		9	-0.100	-0.112	9.8336	0.020
		10	-0.096	-0.118	11.608	0.021
		11	-0.017	-0.074	11.663	0.040
		12	0.185	0.131	18.344	0.005
		13	0.147	0.128	22.629	0.002
		14	-0.047	-0.037	23.063	0.003
		15	-0.019	0.013	23.133	0.006
		16	-0.134	-0.079	26.749	0.003
		17	-0.052	-0.045	27.290	0.004
		18	0.005	-0.059	27.296	0.007
		19	0.028	-0.022	27.456	0.011
		20	0.031	-0.007	27.649	0.016
		21	0.008	0.019	27.663	0.024
		22	-0.129	-0.088	31.104	0.013
		23	0.031	0.035	31.303	0.018
		24	0.140	0.114	35.442	0.008
		25	0.018	-0.035	35.508	0.012
		26	-0.016	-0.064	35.561	0.017
		27	-0.069	-0.072	36.573	0.019
		28	-0.090	-0.054	38.316	0.017
		29	-0.056	-0.059	38.996	0.020
		30	-0.051	-0.098	39.571	0.024
		31	0.061	0.006	40.382	0.027
		32	-0.010	-0.078	40.403	0.036
		33	-0.076	-0.137	41.686	0.035
		34	-0.054	-0.092	42.341	0.040
		35	0.036	0.005	42.641	0.049
		36	0.149	0.048	47.744	0.021
		37	0.095	0.031	49.825	0.017
		38	-0.053	-0.073	50.473	0.020
		39	-0.013	-0.001	50.515	0.026
		40	-0.013	0.054	50.555	0.034
		41	-0.077	-0.052	51.945	0.033
		42	0.004	-0.021	51.949	0.042
		43	0.070	0.035	53.111	0.042
		44	0.085	0.066	54.839	0.038
		45	0.009	0.060	54.857	0.047

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C AR(1) AR(2) AR(3) MA(1) MA(2)
MA(3) (ต่อ)



46	-0.055	0.034	55.597	0.052
47	0.079	0.145	57.151	0.048
48	0.062	0.067	58.098	0.050
49	0.003	-0.030	58.099	0.062
50	-0.020	-0.020	58.203	0.074
51	-0.015	0.055	58.257	0.089
52	-0.032	0.014	58.525	0.102
53	-0.002	0.079	58.527	0.121
54	-0.026	0.040	58.700	0.139
55	-0.071	-0.113	60.010	0.135
56	0.019	-0.053	60.110	0.155
57	0.080	0.068	61.802	0.143
58	-0.010	0.025	61.828	0.165
59	-0.026	-0.101	62.012	0.186
60	0.103	0.008	64.923	0.147
61	-0.070	-0.057	66.291	0.142
62	-0.047	-0.050	66.897	0.151
63	0.043	0.027	67.420	0.163
64	0.039	0.095	67.840	0.177
65	-0.022	0.009	67.972	0.198
66	0.032	0.028	68.259	0.217
67	-0.067	-0.019	69.544	0.212
68	-0.039	-0.024	69.983	0.227
69	-0.044	-0.012	70.561	0.240
70	-0.044	-0.030	71.145	0.252
71	0.061	0.004	72.268	0.250
72	0.051	0.012	73.058	0.257
73	-0.033	0.012	73.389	0.277
74	-0.132	-0.084	78.784	0.175
75	0.015	0.033	78.850	0.196
76	-0.030	-0.029	79.141	0.213
77	0.052	0.000	80.002	0.217
78	0.078	0.036	81.949	0.198
79	-0.050	-0.044	82.750	0.204
80	-0.071	-0.083	84.386	0.192
81	0.026	0.014	84.602	0.210
82	-0.020	0.022	84.730	0.231
83	0.045	-0.063	85.422	0.239
84	0.158	0.046	93.923	0.106
85	-0.021	0.023	94.077	0.118
86	-0.043	0.037	94.728	0.125
87	-0.074	-0.090	96.661	0.113
88	-0.037	-0.074	97.150	0.121
89	0.045	0.003	97.879	0.126
90	0.055	-0.018	98.964	0.127

ที่มา: จากการคำนวณ

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C SAR(4) SMA(4)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	-0.176	-0.176	5.6516	
		2	-0.060	-0.094	6.3234	
		3	-0.057	-0.089	6.9240	0.009
		4	-0.082	-0.121	8.1626	0.017
		5	-0.053	-0.113	8.6957	0.034
		6	0.055	-0.004	9.2720	0.055
		7	-0.026	-0.051	9.4037	0.094
		8	0.018	-0.018	9.4657	0.149
		9	-0.105	-0.133	11.592	0.115
		10	-0.082	-0.153	12.883	0.116
		11	-0.023	-0.119	12.988	0.163
		12	0.184	0.107	19.587	0.033
		13	0.114	0.139	22.132	0.023
		14	-0.073	-0.043	23.198	0.026
		15	0.009	0.008	23.213	0.039
		16	-0.102	-0.078	25.277	0.032
		17	-0.035	-0.042	25.524	0.043
		18	-0.016	-0.072	25.576	0.060
		19	0.025	-0.046	25.705	0.080
		20	0.032	-0.013	25.921	0.102
		21	0.032	0.038	26.132	0.127
		22	-0.149	-0.098	30.741	0.059
		23	0.039	-0.005	31.056	0.073
		24	0.144	0.122	35.427	0.035
		25	0.010	0.000	35.447	0.047
		26	-0.034	-0.056	35.691	0.059
		27	-0.043	-0.085	36.081	0.070
		28	-0.056	-0.053	36.763	0.079
		29	-0.041	-0.041	37.119	0.093
		30	-0.068	-0.111	38.135	0.096
		31	0.070	-0.011	39.199	0.098
		32	-0.006	-0.078	39.207	0.121
		33	-0.058	-0.132	39.953	0.130
		34	-0.054	-0.118	40.615	0.141
		35	0.023	-0.052	40.739	0.167
		36	0.136	0.017	44.939	0.099
		37	0.081	0.033	46.440	0.094
		38	-0.077	-0.097	47.813	0.090
		39	0.008	-0.047	47.828	0.109
		40	-0.003	0.019	47.831	0.132
		41	-0.075	-0.063	49.160	0.128
		42	-0.007	-0.050	49.173	0.152
		43	0.066	-0.004	50.201	0.154
		44	0.068	0.025	51.306	0.154
		45	0.005	0.054	51.311	0.180

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C SAR(4) SMA(4) (ต่อ)

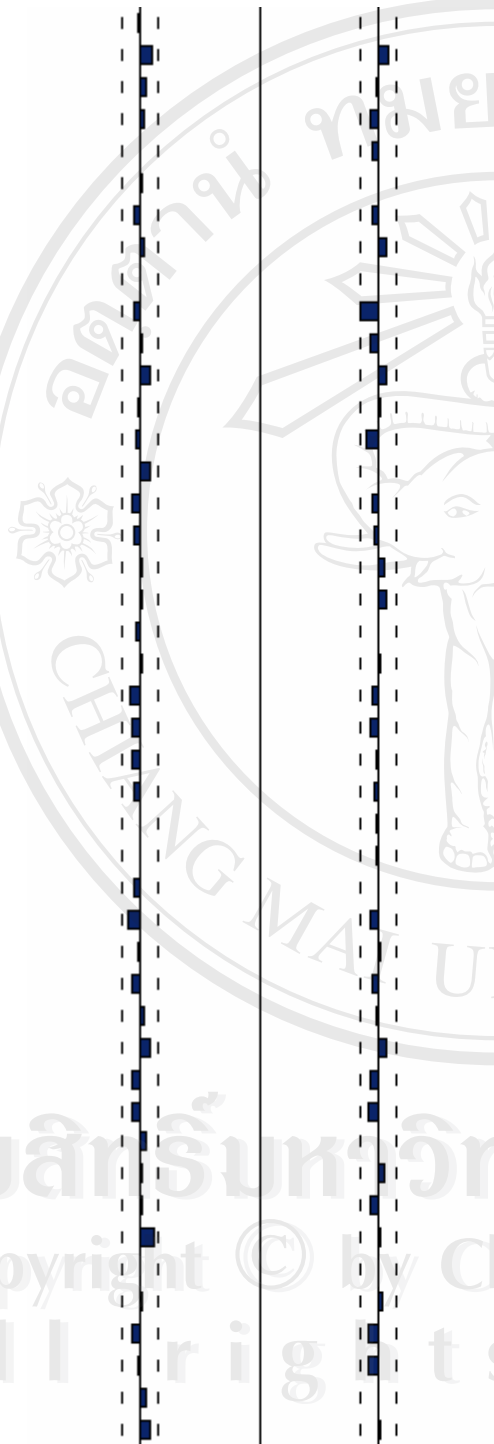
46	-0.064	0.018	52.312	0.183
47	0.078	0.120	53.821	0.172
48	0.047	0.062	54.365	0.186
49	-0.001	-0.012	54.365	0.214
50	-0.022	-0.010	54.487	0.241
51	-0.002	0.042	54.487	0.274
52	-0.043	-0.010	54.960	0.292
53	0.010	0.099	54.986	0.326
54	-0.025	0.078	55.147	0.357
55	-0.070	-0.106	56.421	0.348
56	0.021	-0.074	56.537	0.380
57	0.084	0.065	58.404	0.351
58	-0.029	0.050	58.623	0.379
59	-0.038	-0.092	59.007	0.402
60	0.123	-0.002	63.128	0.300
61	-0.070	-0.051	64.468	0.291
62	-0.046	-0.052	65.063	0.305
63	0.045	0.013	65.619	0.320
64	0.038	0.073	66.034	0.339
65	-0.028	0.023	66.257	0.365
66	0.042	0.048	66.761	0.382
67	-0.069	-0.007	68.147	0.371
68	-0.015	-0.035	68.212	0.402
69	-0.031	0.000	68.503	0.426
70	-0.032	-0.014	68.816	0.450
71	0.044	0.006	69.411	0.463
72	0.046	0.005	70.045	0.476
73	-0.022	0.027	70.188	0.505
74	-0.102	-0.054	73.415	0.431
75	0.017	0.022	73.509	0.461
76	-0.035	-0.027	73.897	0.482
77	0.048	-0.001	74.632	0.490
78	0.087	0.077	77.041	0.445
79	-0.069	-0.039	78.565	0.429
80	-0.065	-0.088	79.962	0.417
81	0.050	-0.001	80.784	0.423
82	-0.010	0.060	80.815	0.453
83	0.002	-0.061	80.816	0.485
84	0.140	0.022	87.473	0.319
85	-0.029	0.006	87.771	0.339
86	-0.011	0.075	87.815	0.366
87	-0.076	-0.063	89.857	0.338
88	-0.035	-0.103	90.284	0.355
89	0.029	-0.038	90.586	0.375
90	0.068	-0.006	92.266	0.357

ที่มา: จากการคำนวณ

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C AR(1) SAR(4) MA(1) SMA(4)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	-0.037	-0.037	0.2426	
		2	0.049	0.048	0.6884	
		3	0.013	0.016	0.7173	
		4	-0.012	-0.013	0.7440	
		5	-0.020	-0.022	0.8184	0.366
		6	0.079	0.079	1.9811	0.371
		7	-0.006	0.002	1.9886	0.575
		8	0.027	0.019	2.1225	0.713
		9	-0.087	-0.089	3.5655	0.614
		10	-0.060	-0.067	4.2465	0.643
		11	-0.012	-0.006	4.2746	0.748
		12	0.154	0.161	8.8678	0.354
		13	0.095	0.114	10.629	0.302
		14	-0.067	-0.089	11.506	0.319
		15	-0.012	-0.033	11.536	0.400
		16	-0.132	-0.126	14.998	0.242
		17	-0.065	-0.058	15.845	0.258
		18	-0.049	-0.065	16.330	0.294
		19	-0.013	-0.032	16.363	0.358
		20	-0.025	-0.022	16.490	0.419
		21	-0.011	0.013	16.516	0.488
		22	-0.160	-0.106	21.779	0.242
		23	0.004	-0.001	21.782	0.295
		24	0.068	0.064	22.746	0.301
		25	-0.036	-0.081	23.022	0.343
		26	-0.076	-0.114	24.247	0.334
		27	-0.086	-0.115	25.822	0.309
		28	-0.125	-0.090	29.181	0.213
		29	-0.088	-0.058	30.872	0.193
		30	-0.101	-0.104	33.081	0.160
		31	0.020	-0.003	33.166	0.192
		32	-0.053	-0.084	33.790	0.208
		33	-0.068	-0.097	34.826	0.210
		34	-0.055	-0.057	35.499	0.225
		35	0.032	0.021	35.728	0.256
		36	0.114	0.060	38.688	0.193
		37	0.092	0.059	40.599	0.170
		38	-0.040	-0.071	40.958	0.192
		39	0.032	-0.002	41.199	0.218
		40	0.005	0.043	41.206	0.253
		41	-0.033	-0.027	41.467	0.282
		42	0.029	-0.005	41.671	0.314
		43	0.095	0.036	43.834	0.274
		44	0.082	0.037	45.436	0.256
		45	0.049	0.061	46.027	0.272

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C AR(1) SAR(4) MA(1) SMA(4) (ต่อ)



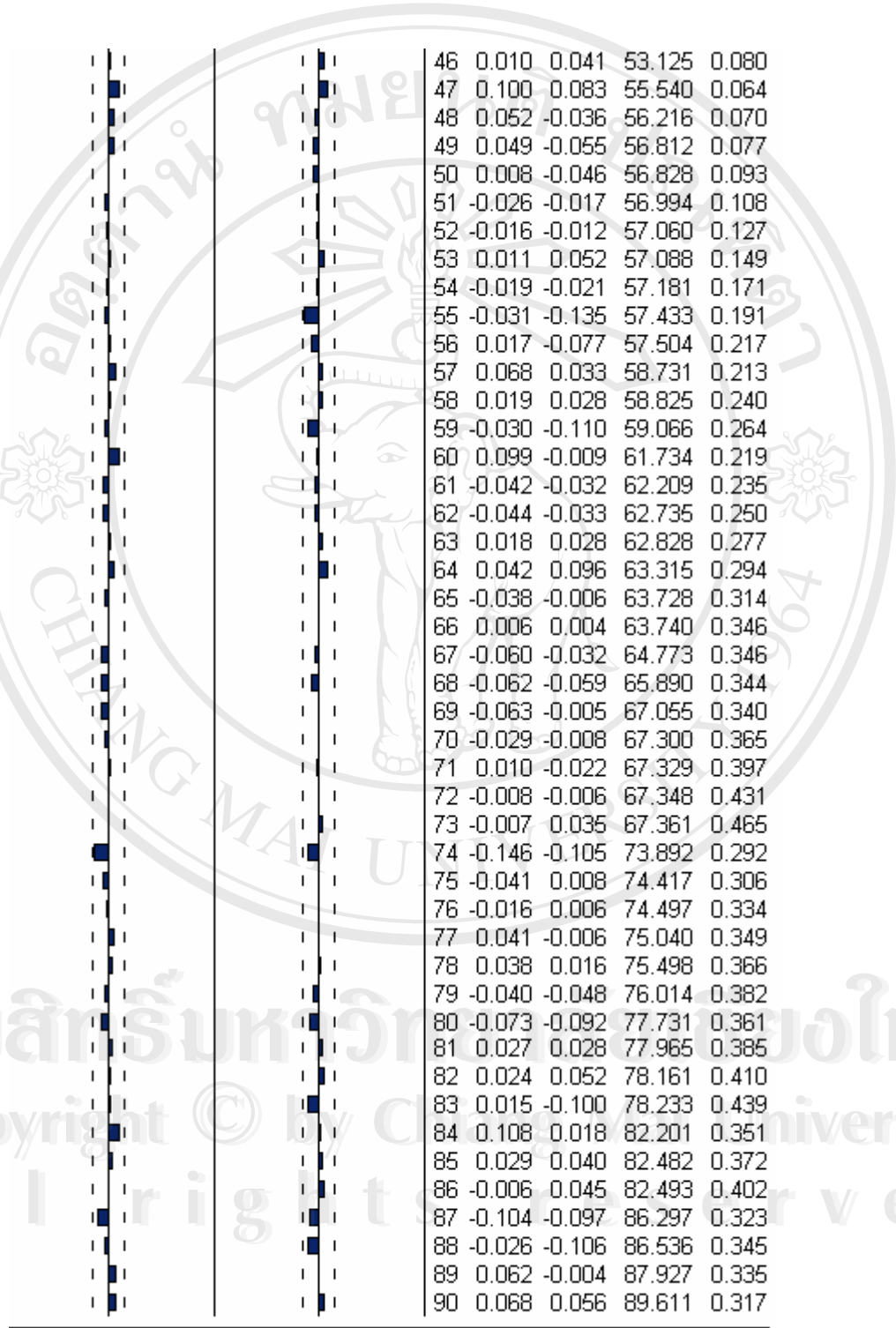
46	-0.011	0.003	46.054	0.308
47	0.112	0.084	49.109	0.242
48	0.055	-0.020	49.858	0.252
49	0.032	-0.064	50.112	0.278
50	0.008	-0.054	50.127	0.313
51	0.012	-0.005	50.166	0.349
52	-0.042	-0.057	50.621	0.370
53	0.026	0.057	50.802	0.402
54	-0.006	-0.002	50.811	0.441
55	-0.055	-0.157	51.611	0.450
56	0.010	-0.080	51.640	0.488
57	0.091	0.072	53.858	0.441
58	-0.009	0.016	53.881	0.479
59	-0.031	-0.105	54.135	0.508
60	0.092	-0.004	56.436	0.459
61	-0.058	-0.042	57.363	0.462
62	-0.042	-0.030	57.859	0.481
63	0.018	0.046	57.950	0.514
64	0.009	0.070	57.971	0.550
65	-0.038	0.005	58.386	0.571
66	0.021	0.013	58.512	0.602
67	-0.095	-0.042	61.110	0.544
68	-0.061	-0.068	62.199	0.540
69	-0.062	-0.017	63.348	0.535
70	-0.055	-0.032	64.244	0.538
71	-0.001	-0.008	64.245	0.573
72	-0.005	-0.023	64.251	0.606
73	-0.047	0.002	64.918	0.617
74	-0.103	-0.064	68.211	0.538
75	-0.010	0.021	68.245	0.571
76	-0.058	-0.044	69.292	0.569
77	0.034	-0.009	69.668	0.589
78	0.085	0.062	72.005	0.544
79	-0.063	-0.061	73.298	0.534
80	-0.066	-0.094	74.737	0.519
81	0.043	0.002	75.335	0.532
82	0.009	0.050	75.364	0.564
83	0.012	-0.061	75.409	0.594
84	0.129	0.024	81.042	0.446
85	-0.007	-0.005	81.059	0.477
86	0.010	0.035	81.095	0.508
87	-0.065	-0.095	82.576	0.493
88	-0.024	-0.096	82.788	0.517
89	0.047	-0.006	83.569	0.524
90	0.083	0.010	86.065	0.478

ที่มา: จากการคำนวณ

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C AR(1) AR(2) AR(3) SAR(4) MA(3)
SMA(4)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	0.005	0.005	0.0048	
		2	0.037	0.037	0.2585	
		3	-0.032	-0.032	0.4442	
		4	-0.062	-0.063	1.1417	
		5	0.025	0.028	1.2584	
		6	0.041	0.044	1.5645	
		7	0.031	0.025	1.7458	0.186
		8	-0.005	-0.011	1.7508	0.417
		9	-0.141	-0.139	5.5196	0.137
		10	-0.049	-0.042	5.9744	0.201
		11	0.006	0.020	5.9811	0.308
		12	0.131	0.127	9.2614	0.159
		13	0.146	0.130	13.370	0.064
		14	-0.056	-0.069	13.983	0.082
		15	-0.069	-0.072	14.910	0.093
		16	-0.120	-0.095	17.755	0.059
		17	-0.049	-0.037	18.228	0.076
		18	-0.060	-0.094	18.949	0.090
		19	0.017	-0.015	19.006	0.123
		20	0.015	0.016	19.053	0.163
		21	-0.051	-0.006	19.571	0.189
		22	-0.142	-0.100	23.712	0.096
		23	0.016	0.017	23.762	0.126
		24	0.066	0.047	24.654	0.135
		25	0.001	-0.072	24.654	0.172
		26	-0.053	-0.106	25.242	0.192
		27	-0.141	-0.141	29.415	0.104
		28	-0.105	-0.070	31.779	0.081
		29	-0.091	-0.056	33.535	0.072
		30	-0.124	-0.143	36.839	0.045
		31	0.047	-0.003	37.321	0.054
		32	-0.046	-0.082	37.777	0.064
		33	-0.104	-0.140	40.176	0.049
		34	-0.032	-0.050	40.396	0.061
		35	0.026	0.024	40.542	0.075
		36	0.116	0.033	43.569	0.052
		37	0.124	0.058	47.068	0.032
		38	-0.037	-0.075	47.375	0.039
		39	-0.029	-0.051	47.564	0.048
		40	0.019	0.055	47.644	0.060
		41	-0.048	-0.054	48.190	0.068
		42	0.014	-0.035	48.239	0.083
		43	0.116	0.064	51.401	0.058
		44	0.082	0.030	53.007	0.054
		45	0.020	0.031	53.101	0.065

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C AR(1) AR(2) AR(3) SAR(4) MA(3) SMA(4) (ต่อ)

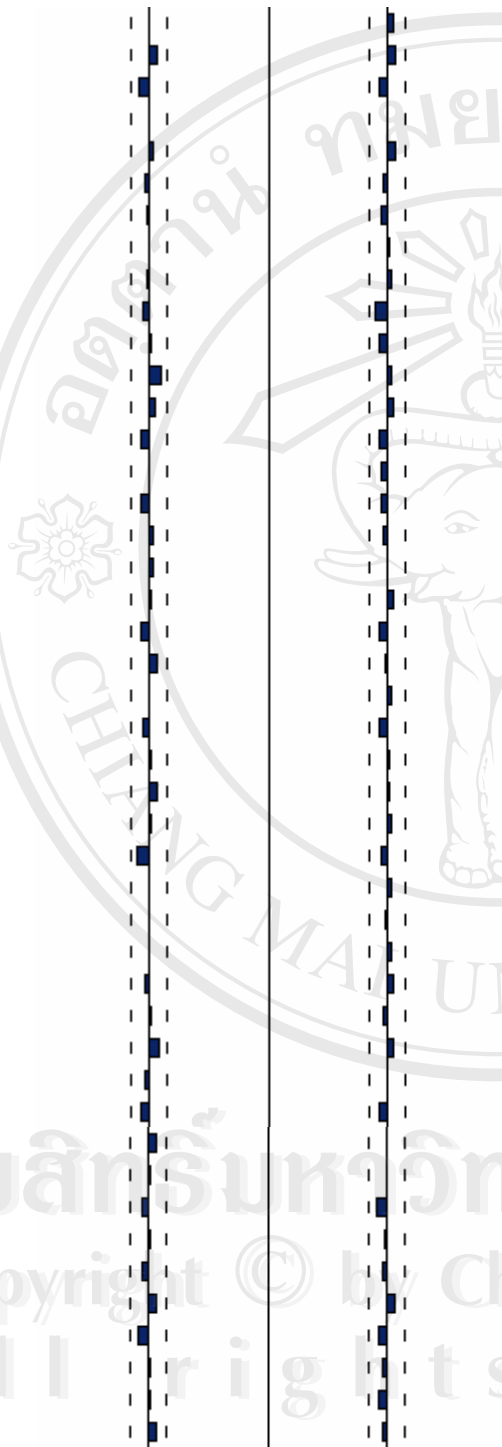


ที่มา: จากการคำนวณ

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C SAR(12) SMA(12)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	-0.270	-0.270	12.801	
		2	-0.026	-0.107	12.917	
		3	-0.056	-0.101	13.469	0.000
		4	0.092	0.048	14.970	0.001
		5	-0.071	-0.043	15.866	0.001
		6	-0.023	-0.053	15.964	0.003
		7	-0.094	-0.128	17.556	0.004
		8	0.149	0.075	21.582	0.001
		9	-0.117	-0.075	24.088	0.001
		10	-0.005	-0.057	24.093	0.002
		11	-0.054	-0.079	24.637	0.003
		12	0.067	-0.013	25.483	0.005
		13	0.050	0.074	25.952	0.007
		14	-0.049	-0.023	26.402	0.009
		15	-0.017	-0.016	26.460	0.015
		16	-0.007	-0.067	26.469	0.023
		17	-0.038	-0.070	26.746	0.031
		18	-0.051	-0.098	27.253	0.039
		19	0.007	-0.040	27.262	0.054
		20	0.093	0.066	28.948	0.049
		21	0.054	0.084	29.525	0.058
		22	-0.122	-0.069	32.503	0.038
		23	0.065	0.013	33.350	0.042
		24	0.010	0.005	33.371	0.057
		25	0.003	-0.014	33.373	0.075
		26	-0.034	-0.014	33.616	0.092
		27	-0.016	-0.043	33.666	0.115
		28	-0.036	-0.085	33.936	0.137
		29	-0.066	-0.136	34.846	0.143
		30	-0.124	-0.176	38.067	0.097
		31	0.102	-0.022	40.263	0.080
		32	0.004	-0.022	40.267	0.100
		33	-0.030	-0.097	40.457	0.119
		34	-0.003	-0.067	40.459	0.145
		35	0.047	-0.023	40.948	0.161
		36	-0.006	-0.049	40.955	0.192
		37	0.065	0.053	41.885	0.197
		38	-0.061	-0.022	42.706	0.205
		39	0.040	-0.040	43.060	0.228
		40	0.009	-0.032	43.080	0.263
		41	-0.096	-0.152	45.186	0.229
		42	-0.019	-0.088	45.271	0.261
		43	0.111	0.055	48.141	0.206
		44	0.042	0.039	48.553	0.226
		45	0.045	0.063	49.031	0.244

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C SAR(12) SMA(12) (ต่อ)



46	-0.001	0.048	49.031	0.278
47	0.068	0.070	50.139	0.277
48	-0.092	-0.063	52.161	0.247
49	-0.001	0.003	52.162	0.280
50	0.030	0.071	52.381	0.308
51	-0.031	-0.034	52.616	0.336
52	-0.023	-0.056	52.750	0.368
53	0.000	0.010	52.750	0.406
54	-0.010	0.027	52.777	0.444
55	-0.054	-0.107	53.530	0.454
56	0.008	-0.072	53.548	0.492
57	0.106	0.033	56.460	0.420
58	0.053	0.046	57.199	0.430
59	-0.080	-0.062	58.914	0.405
60	0.006	-0.041	58.922	0.442
61	-0.067	-0.054	60.123	0.435
62	0.028	-0.030	60.339	0.463
63	0.027	0.005	60.541	0.493
64	0.017	0.043	60.622	0.526
65	-0.069	-0.061	61.956	0.514
66	0.065	-0.019	63.149	0.507
67	0.000	0.031	63.149	0.542
68	-0.055	-0.064	64.027	0.546
69	0.013	0.010	64.080	0.579
70	0.075	0.020	65.729	0.555
71	0.010	0.029	65.759	0.588
72	-0.109	-0.045	69.329	0.500
73	-0.007	0.025	69.344	0.533
74	-0.006	-0.011	69.357	0.566
75	-0.003	0.025	69.359	0.599
76	-0.026	0.044	69.578	0.624
77	0.013	-0.030	69.627	0.654
78	0.087	0.056	72.034	0.608
79	-0.039	0.000	72.512	0.624
80	-0.073	-0.069	74.265	0.599
81	0.076	0.000	76.171	0.569
82	0.023	0.002	76.350	0.595
83	-0.048	-0.095	77.109	0.602
84	0.018	-0.015	77.219	0.629
85	-0.047	-0.031	77.973	0.635
86	0.078	0.074	80.117	0.600
87	-0.094	-0.067	83.232	0.534
88	0.013	-0.040	83.295	0.563
89	0.016	-0.077	83.387	0.590
90	0.071	-0.033	85.252	0.563

ที่มา: จากการคำนวณ

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C AR(1) SAR(12) SMA(12)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	-0.023	-0.023	0.0911	
		2	-0.127	-0.128	2.9118	
		3	-0.046	-0.053	3.2838	
		4	0.064	0.046	4.0081	0.045
		5	-0.058	-0.069	4.6075	0.100
		6	-0.071	-0.065	5.5046	0.138
		7	-0.067	-0.084	6.3235	0.176
		8	0.105	0.077	8.3279	0.139
		9	-0.093	-0.112	9.9076	0.129
		10	-0.062	-0.053	10.606	0.157
		11	-0.042	-0.067	10.928	0.206
		12	0.069	0.020	11.811	0.224
		13	0.069	0.064	12.691	0.241
		14	-0.047	-0.046	13.112	0.286
		15	-0.044	-0.030	13.474	0.336
		16	-0.030	-0.083	13.643	0.399
		17	-0.057	-0.075	14.274	0.429
		18	-0.059	-0.080	14.943	0.456
		19	0.021	0.001	15.031	0.522
		20	0.123	0.088	17.974	0.390
		21	0.051	0.035	18.495	0.424
		22	-0.111	-0.083	20.932	0.341
		23	0.038	0.033	21.218	0.384
		24	0.028	-0.013	21.381	0.436
		25	-0.006	-0.021	21.389	0.497
		26	-0.032	-0.017	21.603	0.544
		27	-0.040	-0.062	21.925	0.584
		28	-0.077	-0.116	23.151	0.569
		29	-0.122	-0.154	26.263	0.449
		30	-0.130	-0.146	29.801	0.323
		31	0.086	0.008	31.377	0.301
		32	0.025	-0.057	31.507	0.342
		33	-0.038	-0.109	31.817	0.376
		34	0.002	-0.053	31.818	0.426
		35	0.053	-0.023	32.440	0.445
		36	0.028	-0.026	32.610	0.486
		37	0.059	0.052	33.378	0.498
		38	-0.034	-0.050	33.629	0.534
		39	0.034	-0.040	33.892	0.569
		40	-0.015	-0.077	33.941	0.613
		41	-0.113	-0.162	36.853	0.522
		42	-0.008	-0.029	36.869	0.567
		43	0.136	0.066	41.116	0.421
		44	0.090	0.024	42.998	0.386
		45	0.062	0.057	43.908	0.391

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C AR(1) SAR(12) SMA(12) (ต่อ)

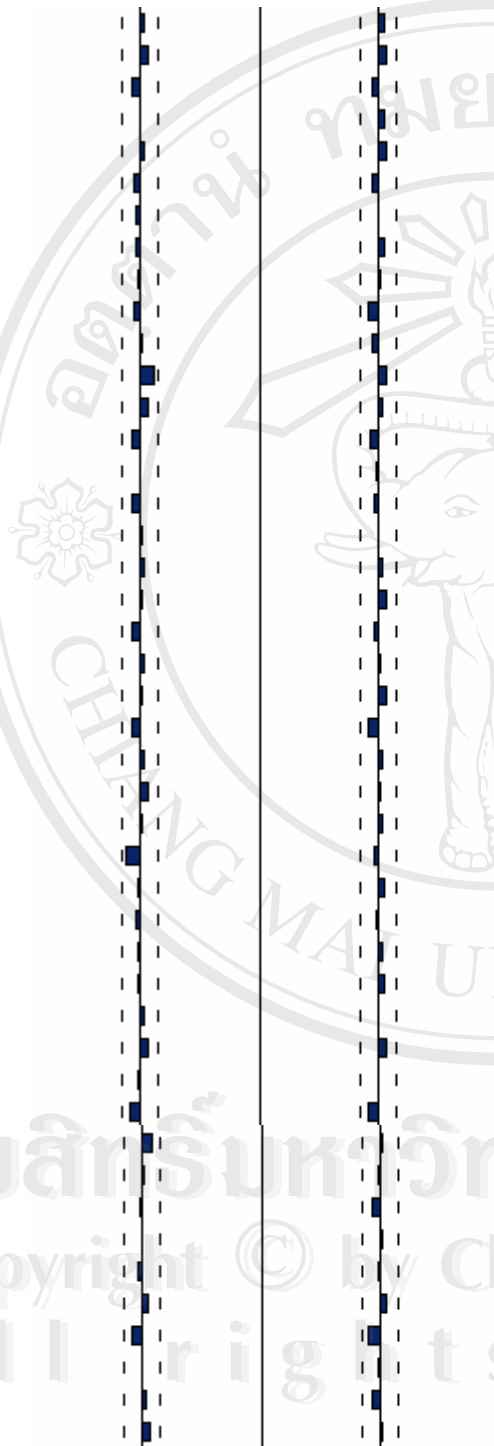
46	0.038	0.049	44.256	0.418
47	0.047	0.035	44.781	0.439
48	-0.094	-0.078	46.886	0.395
49	-0.012	0.043	46.922	0.434
50	0.030	0.042	47.141	0.467
51	-0.039	-0.074	47.513	0.493
52	-0.034	-0.037	47.803	0.522
53	-0.005	0.033	47.810	0.562
54	-0.020	-0.004	47.913	0.597
55	-0.063	-0.124	48.931	0.595
56	0.023	-0.033	49.072	0.628
57	0.139	0.046	54.094	0.471
58	0.067	0.008	55.262	0.465
59	-0.083	-0.080	57.080	0.435
60	-0.036	-0.031	57.423	0.459
61	-0.069	-0.057	58.686	0.450
62	0.023	-0.025	58.826	0.482
63	0.050	0.017	59.519	0.493
64	0.005	0.020	59.525	0.530
65	-0.059	-0.072	60.498	0.530
66	0.054	0.005	61.321	0.536
67	0.000	0.005	61.321	0.572
68	-0.066	-0.073	62.588	0.562
69	0.019	0.017	62.690	0.593
70	0.092	0.008	65.187	0.540
71	-0.005	0.003	65.194	0.574
72	-0.134	-0.054	70.566	0.425
73	-0.028	0.034	70.803	0.451
74	-0.011	-0.025	70.838	0.483
75	-0.011	0.034	70.876	0.515
76	-0.031	0.013	71.168	0.539
77	0.043	-0.015	71.745	0.553
78	0.094	0.063	74.532	0.494
79	-0.040	-0.033	75.048	0.509
80	-0.073	-0.061	76.767	0.486
81	0.067	-0.001	78.241	0.471
82	0.038	-0.024	78.713	0.488
83	-0.035	-0.087	79.137	0.506
84	-0.007	0.001	79.156	0.537
85	-0.020	-0.002	79.291	0.564
86	0.045	0.051	80.000	0.573
87	-0.080	-0.096	82.262	0.533
88	-0.013	-0.049	82.318	0.562
89	0.052	-0.069	83.275	0.563
90	0.072	-0.021	85.165	0.536

ที่มา: จากการคำนวณ

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C SAR(12) MA(1) SMA(12)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	-0.073	-0.073	0.9284	
		2	-0.058	-0.064	1.5204	
		3	-0.052	-0.062	2.0076	
		4	0.033	0.021	2.2053	0.138
		5	-0.059	-0.063	2.8387	0.242
		6	-0.065	-0.075	3.5947	0.309
		7	-0.066	-0.084	4.3769	0.357
		8	0.089	0.061	5.8162	0.325
		9	-0.102	-0.109	7.7444	0.257
		10	-0.036	-0.055	7.9778	0.335
		11	-0.024	-0.046	8.0871	0.425
		12	0.079	0.039	9.2620	0.413
		13	0.084	0.089	10.596	0.390
		14	-0.033	-0.024	10.804	0.460
		15	-0.040	-0.037	11.103	0.520
		16	-0.046	-0.082	11.505	0.569
		17	-0.063	-0.077	12.279	0.584
		18	-0.061	-0.081	13.012	0.601
		19	0.018	0.002	13.077	0.667
		20	0.090	0.067	14.677	0.619
		21	0.055	0.050	15.283	0.642
		22	-0.103	-0.084	17.411	0.562
		23	0.069	0.051	18.374	0.563
		24	0.027	0.010	18.525	0.616
		25	0.022	0.004	18.627	0.668
		26	-0.037	-0.024	18.908	0.707
		27	-0.035	-0.053	19.167	0.743
		28	-0.088	-0.108	20.769	0.705
		29	-0.114	-0.134	23.473	0.606
		30	-0.137	-0.139	27.423	0.441
		31	0.089	0.018	29.102	0.407
		32	-0.003	-0.054	29.104	0.460
		33	-0.025	-0.105	29.237	0.505
		34	0.003	-0.050	29.239	0.557
		35	0.065	0.005	30.167	0.560
		36	0.029	-0.010	30.352	0.600
		37	0.080	0.075	31.762	0.578
		38	-0.037	-0.032	32.071	0.610
		39	0.031	-0.024	32.291	0.646
		40	-0.021	-0.031	32.389	0.685
		41	-0.116	-0.123	35.458	0.588
		42	-0.016	-0.011	35.515	0.630
		43	0.132	0.109	39.551	0.490
		44	0.065	0.029	40.549	0.491
		45	0.072	0.073	41.769	0.481

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C SAR(12) MA(1) SMA(12) (ต่อ)



46	0.030	0.057	41.984	0.515
47	0.064	0.065	42.958	0.516
48	-0.070	-0.047	44.139	0.508
49	-0.005	0.044	44.144	0.550
50	0.038	0.070	44.502	0.577
51	-0.047	-0.048	45.042	0.595
52	-0.032	-0.004	45.292	0.624
53	-0.029	0.052	45.509	0.654
54	-0.022	0.022	45.637	0.686
55	-0.055	-0.095	46.413	0.692
56	0.020	-0.044	46.516	0.723
57	0.130	0.063	50.918	0.594
58	0.073	0.027	52.309	0.578
59	-0.071	-0.066	53.650	0.564
60	-0.006	-0.016	53.661	0.601
61	-0.068	-0.032	54.889	0.592
62	0.023	-0.008	55.032	0.623
63	0.034	0.034	55.348	0.646
64	0.009	0.060	55.372	0.679
65	-0.063	-0.032	56.488	0.674
66	0.038	0.020	56.894	0.692
67	0.016	0.062	56.971	0.721
68	-0.078	-0.087	58.731	0.695
69	0.031	0.040	59.006	0.717
70	0.071	0.013	60.502	0.699
71	0.013	0.026	60.550	0.728
72	-0.125	-0.040	65.263	0.605
73	-0.022	0.046	65.414	0.633
74	-0.028	-0.017	65.662	0.657
75	-0.014	0.034	65.723	0.685
76	-0.024	0.051	65.901	0.710
77	0.032	0.003	66.225	0.728
78	0.074	0.073	67.961	0.705
79	-0.022	0.006	68.114	0.729
80	-0.089	-0.097	70.697	0.680
81	0.083	0.021	72.972	0.640
82	0.021	-0.022	73.114	0.665
83	-0.024	-0.080	73.309	0.688
84	0.002	0.016	73.310	0.716
85	-0.036	-0.018	73.764	0.730
86	0.044	-0.053	74.433	0.738
87	-0.094	-0.108	77.549	0.677
88	0.005	-0.020	77.557	0.704
89	0.028	-0.065	77.847	0.723
90	0.073	0.011	79.783	0.696

ที่มา: จากการคำนวณ

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C AR(1) AR(2) SAR(12) SMA(12)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	-0.014	-0.014	0.0342	
		2	-0.014	-0.014	0.0669	
		3	-0.074	-0.074	1.0238	
		4	0.051	0.049	1.4857	
		5	-0.069	-0.071	2.3399	0.126
		6	-0.049	-0.056	2.7765	0.250
		7	-0.083	-0.081	4.0244	0.259
		8	0.091	0.076	5.5157	0.238
		9	-0.107	-0.112	7.5937	0.180
		10	-0.028	-0.040	7.7349	0.258
		11	-0.056	-0.052	8.3163	0.306
		12	0.062	0.023	9.0182	0.341
		13	0.046	0.052	9.4169	0.400
		14	-0.046	-0.064	9.8203	0.456
		15	-0.045	-0.039	10.200	0.512
		16	-0.056	-0.095	10.797	0.546
		17	-0.042	-0.047	11.141	0.599
		18	-0.058	-0.074	11.784	0.624
		19	0.033	0.028	11.994	0.680
		20	0.112	0.089	14.447	0.565
		21	0.041	0.014	14.783	0.611
		22	-0.104	-0.100	16.917	0.529
		23	0.047	0.033	17.364	0.565
		24	-0.008	-0.024	17.376	0.628
		25	0.006	-0.027	17.383	0.688
		26	-0.045	-0.023	17.791	0.718
		27	-0.047	-0.074	18.235	0.745
		28	-0.091	-0.116	19.945	0.700
		29	-0.131	-0.156	23.523	0.547
		30	-0.140	-0.146	27.604	0.378
		31	0.074	0.010	28.769	0.372
		32	0.008	-0.055	28.781	0.424
		33	-0.028	-0.123	28.953	0.468
		34	0.009	-0.034	28.970	0.519
		35	0.065	0.001	29.874	0.524
		36	0.014	-0.045	29.916	0.572
		37	0.073	0.054	31.090	0.562
		38	-0.030	-0.062	31.290	0.601
		39	0.041	-0.049	31.659	0.630
		40	-0.007	-0.060	31.669	0.675
		41	-0.093	-0.145	33.646	0.627
		42	0.007	-0.005	33.656	0.671
		43	0.144	0.093	38.436	0.495
		44	0.108	0.044	41.125	0.421
		45	0.079	0.053	42.570	0.403

Correlogram of Residuals ของแบบจำลอง $\Delta \ln CTN_t$ C AR(1) AR(2) SAR(12) SMA(12) (ต่อ)

46	0.040	0.048	42.941	0.431
47	0.052	0.037	43.590	0.446
48	-0.091	-0.080	45.595	0.406
49	-0.028	0.029	45.789	0.439
50	0.008	0.042	45.804	0.480
51	-0.018	-0.052	45.884	0.519
52	-0.022	-0.022	46.010	0.555
53	-0.013	0.046	46.054	0.593
54	-0.012	-0.005	46.093	0.631
55	-0.048	-0.113	46.681	0.646
56	0.021	-0.020	46.797	0.678
57	0.121	0.059	50.606	0.568
58	0.049	0.006	51.231	0.582
59	-0.065	-0.078	52.342	0.577
60	-0.040	-0.036	52.764	0.598
61	-0.069	-0.021	54.036	0.587
62	0.027	-0.007	54.231	0.616
63	0.055	0.035	55.051	0.622
64	0.001	0.019	55.051	0.657
65	-0.054	-0.060	55.851	0.662
66	0.028	-0.005	56.069	0.688
67	-0.020	0.002	56.186	0.716
68	-0.061	-0.058	57.260	0.712
69	-0.004	0.016	57.264	0.742
70	0.047	-0.008	57.921	0.750
71	-0.013	-0.012	57.971	0.776
72	-0.120	-0.045	62.255	0.674
73	-0.021	0.058	62.392	0.700
74	-0.029	-0.026	62.645	0.722
75	-0.009	0.024	62.672	0.749
76	-0.017	0.020	62.760	0.773
77	0.053	-0.016	63.632	0.775
78	0.097	0.078	66.627	0.716
79	-0.025	-0.017	66.829	0.738
80	-0.074	-0.080	68.628	0.714
81	0.049	-0.009	69.427	0.718
82	0.040	-0.003	69.959	0.730
83	-0.037	-0.099	70.424	0.744
84	-0.008	0.007	70.446	0.769
85	-0.037	-0.015	70.916	0.781
86	0.059	0.037	72.145	0.773
87	-0.069	-0.095	73.846	0.754
88	0.007	-0.053	73.864	0.778
89	0.039	-0.054	74.410	0.787
90	0.077	-0.008	76.591	0.756

ที่มา: จากการคำนวณ



ภาคผนวก ง

ค่าสถิติการประมาณค่าพารามิเตอร์

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การประมาณค่าพารามิเตอร์

แบบจำลอง $\Delta \ln CTN_t$ C AR(1) MA(1)

Dependent Variable: D(LNCTN)
 Method: Least Squares
 Date: 09/05/06 Time: 22:05
 Sample(adjusted): 3 185
 Included observations: 183 after adjusting endpoints
 Convergence achieved after 14 iterations
 Backcast: 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006427	0.010761	0.597244	0.5511
AR(1)	-0.900846	0.055081	-16.35506	0.0000
MA(1)	0.856127	0.076256	11.22698	0.0000
R-squared	0.102134	Mean dependent var	0.007031	
Adjusted R-squared	0.092157	S.D. dependent var	0.156524	
S.E. of regression	0.149137	Akaike info criterion	-0.951640	
Sum squared resid	4.003552	Schwarz criterion	-0.899026	
Log likelihood	90.07508	F-statistic	10.23764	
Durbin-Watson stat	2.221592	Prob(F-statistic)	0.000062	
Inverted AR Roots	-.90			
Inverted MA Roots	-.86			

ที่มา: จากการศึกษา

การประมาณค่าพารามิเตอร์

แบบจำลอง $\Delta \ln \text{CTN}_t$ C AR(1) AR(2) AR(3) MA(1)

Dependent Variable: D(LNCTN)

Method: Least Squares

Date: 09/05/06 Time: 22:06

Sample(adjusted): 5 185

Included observations: 181 after adjusting endpoints

Convergence achieved after 8 iterations

Backcast: 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.005025	0.006874	0.731024	0.4657
AR(1)	-1.007403	0.115570	-8.716854	0.0000
AR(2)	-0.421736	0.100807	-4.183582	0.0000
AR(3)	-0.301908	0.071184	-4.241218	0.0000
MA(1)	0.785805	0.101668	7.729127	0.0000
R-squared	0.156670	Mean dependent var		0.005464
Adjusted R-squared	0.137503	S.D. dependent var		0.152402
S.E. of regression	0.141537	Akaike info criterion		-1.045273
Sum squared resid	3.525767	Schwarz criterion		-0.956917
Log likelihood	99.59725	F-statistic		8.174115
Durbin-Watson stat	1.999186	Prob(F-statistic)		0.000005
Inverted AR Roots	-.05 -.57i	-.05+.57i	-.91	
Inverted MA Roots	-.79			

ที่มา: จากกรคำนวณ

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การประมาณค่าพารามิเตอร์

แบบจำลอง $\Delta \ln \text{CTN}_t$ C AR(1) AR(2) AR(3) MA(1) MA(2) MA(3)

Dependent Variable: D(LNCTN)

Method: Least Squares

Date: 09/05/06 Time: 22:07

Sample(adjusted): 5 185

Included observations: 181 after adjusting endpoints

Convergence achieved after 27 iterations

Backcast: 2 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.008327	0.008711	0.956010	0.3404
AR(1)	-0.949516	0.092526	-10.26221	0.0000
AR(2)	-0.872523	0.089559	-9.742441	0.0000
AR(3)	-0.789612	0.058773	-13.43490	0.0000
MA(1)	0.796387	0.129591	6.145381	0.0000
MA(2)	0.701237	0.117406	5.972738	0.0000
MA(3)	0.629646	0.089951	6.999889	0.0000
R-squared	0.202308	Mean dependent var	0.005464	
Adjusted R-squared	0.174801	S.D. dependent var	0.152402	
S.E. of regression	0.138443	Akaike info criterion	-1.078810	
Sum squared resid	3.334965	Schwarz criterion	-0.955111	
Log likelihood	104.6323	F-statistic	7.354880	
Durbin-Watson stat	2.086897	Prob(F-statistic)	0.000001	
Inverted AR Roots	-.01 -.92i	-.01+.92i	-.93	
Inverted MA Roots	.03 -.86i	.03+.86i	-.85	

ที่มา: จากการคำนวณ

การประมาณค่าพารามิเตอร์

แบบจำลอง $\Delta \ln CTN_t$ C SAR(4) SMA(4)

Dependent Variable: D(LNCTN)
 Method: Least Squares
 Date: 09/05/06 Time: 22:08
 Sample(adjusted): 6 185
 Included observations: 180 after adjusting endpoints
 Convergence achieved after 10 iterations
 Backcast: 2 5

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.008379	0.016602	0.504715	0.6144
AR(4)	0.776750	0.076629	10.13643	0.0000
MA(4)	-0.663277	0.105112	-6.310163	0.0000
R-squared	0.165851	Mean dependent var	0.006078	
Adjusted R-squared	0.156426	S.D. dependent var	0.152603	
S.E. of regression	0.140160	Akaike info criterion	-1.075536	
Sum squared resid	3.477140	Schwarz criterion	-1.022320	
Log likelihood	99.79828	F-statistic	17.59618	
Durbin-Watson stat	2.327969	Prob(F-statistic)	0.000000	
Inverted AR Roots	.94	.00 -.94i		
Inverted MA Roots	.90	.00+.90i	-.00 -.90i	-.90

ที่มา: จากกรคำนวณ

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แบบจำลอง $\Delta \ln CTN_t$, C AR(1) SAR(4) MA(1) SMA(4)

Dependent Variable: D(LNCTN)

Method: Least Squares

Date: 09/05/06 Time: 22:09

Sample(adjusted): 7 185

Included observations: 179 after adjusting endpoints

Convergence achieved after 19 iterations

Backcast: 2 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.008823	0.002003	4.405538	0.0000
AR(1)	0.718905	0.053564	13.42132	0.0000
SAR(4)	0.851544	0.027285	31.20953	0.0000
MA(1)	-0.980508	0.006282	-156.0905	0.0000
SMA(4)	-0.742489	0.043644	-17.01254	0.0000
R-squared	0.260479	Mean dependent var	0.006847	
Adjusted R-squared	0.243479	S.D. dependent var	0.152681	
S.E. of regression	0.132799	Akaike info criterion	-1.172418	
Sum squared resid	3.068610	Schwarz criterion	-1.083385	
Log likelihood	109.9314	F-statistic	15.32186	
Durbin-Watson stat	2.046377	Prob(F-statistic)	0.000000	
Inverted AR Roots	.96	.72	.00 -.96i	.00+.96i
	-.96			
Inverted MA Roots	.98	.93	.00 -.93i	-.00+.93i
	-.93			

ที่มา: จากการคำนวณ

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การประมาณค่าพารามิเตอร์

แบบจำลอง $\Delta \ln \text{CTN}_t$ C AR(1) AR(2) AR(3) SAR(4) MA(3) SMA(4)

Dependent Variable: D(LNCTN)

Method: Least Squares

Date: 09/05/06 Time: 22:11

Sample(adjusted): 9 185

Included observations: 177 after adjusting endpoints

Convergence achieved after 23 iterations

Backcast: 2 8

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.008069	0.001627	4.960438	0.0000
AR(1)	-0.293485	0.053844	-5.450626	0.0000
AR(2)	-0.269217	0.055350	-4.863924	0.0000
AR(3)	0.719417	0.053848	13.36012	0.0000
SAR(4)	0.771126	0.042167	18.28728	0.0000
MA(3)	-0.967132	0.013409	-72.12654	0.0000
SMA(4)	-0.582531	0.075390	-7.726906	0.0000
R-squared	0.236455	Mean dependent var	0.005157	
Adjusted R-squared	0.209506	S.D. dependent var	0.148419	
S.E. of regression	0.131959	Akaike info criterion	-1.173901	
Sum squared resid	2.960255	Schwarz criterion	-1.048291	
Log likelihood	110.8903	F-statistic	8.774285	
Durbin-Watson stat	1.967953	Prob(F-statistic)	0.000000	
Inverted AR Roots	.94	.72	.00 -.94i	-.00+.94i
	-.51 -.86i	-.51+.86i	-.94	
Inverted MA Roots	.99	.87	.00+.87i	-.00 -.87i
	-.49 -.86i	-.49+.86i	-.87	

ที่มา: จากการคำนวณ

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แบบจำลอง $\Delta \ln CTN_t$, C SAR(12) SMA(12)

Dependent Variable: D(LNCTN)

Method: Least Squares

Date: 09/05/06 Time: 22:11

Sample(adjusted): 14 185

Included observations: 172 after adjusting endpoints

Convergence achieved after 32 iterations

Backcast: 2 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013430	0.021511	0.624317	0.5333
AR(12)	0.912912	0.021312	42.83501	0.0000
MA(12)	-0.885816	0.000105	-8457.563	0.0000
R-squared	0.224216	Mean dependent var	0.008846	
Adjusted R-squared	0.215036	S.D. dependent var	0.143808	
S.E. of regression	0.127411	Akaike info criterion	-1.265510	
Sum squared resid	2.743470	Schwarz criterion	-1.210612	
Log likelihood	111.8339	F-statistic	24.42214	
Durbin-Watson stat	2.515209	Prob(F-statistic)	0.000000	
Inverted AR Roots	.99	.86 -.50i	.86+.50i	.50 -.86i
	.50+.86i	.00+.99i	-.00 -.99i	-.50+.86i
	-.50 -.86i	-.86+.50i	-.86 -.50i	-.99
Inverted MA Roots	.99	.86 -.49i	.86+.49i	.49 -.86i
	.49+.86i	.00+.99i	-.00 -.99i	-.49+.86i
	-.49 -.86i	-.86+.49i	-.86 -.49i	-.99

ที่มา: จากการคำนวณ

การประมาณค่าพารามิเตอร์

แบบจำลอง $\Delta \ln CTN_t$, C AR(1) SAR(12) SMA(12)

Dependent Variable: D(LNCTN)

Method: Least Squares

Date: 09/05/06 Time: 22:13

Sample(adjusted): 15 185

Included observations: 171 after adjusting endpoints

Convergence achieved after 29 iterations

Backcast: 3 14

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013172	0.017403	0.756911	0.4502
AR(1)	-0.285195	0.054806	-5.203701	0.0000
SAR(12)	0.918275	0.020459	44.88366	0.0000
MA(12)	-0.885785	0.000105	-8462.415	0.0000
R-squared	0.282455	Mean dependent var	0.008605	
Adjusted R-squared	0.269565	S.D. dependent var	0.144195	
S.E. of regression	0.123237	Akaike info criterion	-1.326301	
Sum squared resid	2.536289	Schwarz criterion	-1.252812	
Log likelihood	117.3987	F-statistic	21.91265	
Durbin-Watson stat	2.016130	Prob(F-statistic)	0.000000	
Inverted AR Roots	.99	.86+.50i	.86 -.50i	.50 -.86i
	.50+.86i	.00+.99i	-.00 -.99i	-.29
	-.50+.86i	-.50 -.86i	-.86 -.50i	-.86+.50i
	-.99			
Inverted MA Roots	.99	.86 -.49i	.86+.49i	.49 -.86i
	.49+.86i	.00+.99i	-.00 -.99i	-.49+.86i
	-.49 -.86i	-.86+.49i	-.86 -.49i	-.99

ที่มา: จากการคำนวณ

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แบบจำลอง $\Delta \ln CTN_t$, C SAR(12) MA(1) SMA(12)

Dependent Variable: D(LNCTN)

Method: Least Squares

Date: 09/05/06 Time: 22:13

Sample(adjusted): 14 185

Included observations: 172 after adjusting endpoints

Convergence achieved after 22 iterations

Backcast: 1 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.022554	0.019047	1.184135	0.2380
AR(12)	0.921086	0.021194	43.46049	0.0000
MA(1)	-0.196604	0.058997	-3.332439	0.0011
SMA(12)	-0.885794	9.64E-05	-9193.411	0.0000
R-squared	0.272331	Mean dependent var	0.008846	
Adjusted R-squared	0.259336	S.D. dependent var	0.143808	
S.E. of regression	0.123763	Akaike info criterion	-1.317909	
Sum squared resid	2.573320	Schwarz criterion	-1.244712	
Log likelihood	117.3402	F-statistic	20.95802	
Durbin-Watson stat	2.122537	Prob(F-statistic)	0.000000	
Inverted AR Roots	.99	.86+.50i	.86 -.50i	.50+.86i
	.50 -.86i	.00+.99i	-.00 -.99i	-.50+.86i
	-.50 -.86i	-.86+.50i	-.86 -.50i	-.99
Inverted MA Roots	.99	.86 -.49i	.86+.49i	.49 -.86i
	.49+.86i	.20	.00+.99i	-.00 -.99i
	-.49+.86i	-.49 -.86i	-.86+.49i	-.86 -.49i
	-.99			

ที่มา: จากการคำนวณ

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แบบจำลอง $\Delta \ln CTN_t$ C AR(1) AR(2) SAR(12) SMA(12)

Dependent Variable: D(LNCTN)

Method: Least Squares

Date: 09/05/06 Time: 22:15

Sample(adjusted): 16 185

Included observations: 170 after adjusting endpoints

Convergence achieved after 37 iterations

Backcast: 4 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.018919	0.018065	1.047259	0.2965
AR(1)	-0.313547	0.055761	-5.623014	0.0000
AR(2)	-0.109029	0.055869	-1.951530	0.0527
SAR(12)	0.927527	0.021843	42.46284	0.0000
MA(12)	-0.885718	0.000104	-8525.133	0.0000
R-squared	0.280937	Mean dependent var	0.006330	
Adjusted R-squared	0.263505	S.D. dependent var	0.141509	
S.E. of regression	0.121442	Akaike info criterion	-1.349788	
Sum squared resid	2.433449	Schwarz criterion	-1.257559	
Log likelihood	119.7320	F-statistic	16.11633	
Durbin-Watson stat	2.003258	Prob(F-statistic)	0.000000	
Inverted AR Roots	.99	.86+.50i	.86 -.50i	.50+.86i
	.50 -.86i	.00+.99i	-.00 -.99i	-.16+.29i
	-.16 -.29i	-.50+.86i	-.50 -.86i	-.86+.50i
	-.86 -.50i	-.99		
Inverted MA Roots	.99	.86+.49i	.86 -.49i	.49 -.86i
	.49+.86i	.00 -.99i	-.00+.99i	-.49 -.86i
	-.49+.86i	-.86 -.49i	-.86+.49i	-.99

ที่มา: จากการคำนวณ

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