



ภาคผนวก

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ภาคผนวก ก

ข้อมูลที่น่าสนใจในการศึกษา

หน่วย : บาท

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
1/1/2008	376	86.5	164	6.35	0	2971.36
2/1/2008	368	85	157	6.15	47.25	3106.61
3/1/2008	360	83.5	159	6.1	46.5	3077.98
4/1/2008	346	81.5	155	5.95	46.5	3060.11
7/1/2008	334	79.5	152	5.75	45.25	2969.15
8/1/2008	336	82	152	5.8	44	3010.29
9/1/2008	348	83	159	5.8	43	2953.47
10/1/2008	332	80	152	5.55	40.5	2874.87
11/1/2008	326	79.5	151	5.6	40.5	2844.03
14/1/2008	320	78	153	5.45	38.75	2919.74
15/1/2008	308	76	151	5.35	38	2849.61
16/1/2008	304	74	154	5.35	39.5	2822.11
17/1/2008	320	75	156	5.45	40	2803.92
18/1/2008	320	74	152	5.35	40.5	2808.64
21/1/2008	296	72.5	144	5.05	38.25	2749.87
22/1/2008	292	69	136	4.84	37	2808.84
23/1/2008	294	72	137	4.88	37.25	2734.13
24/1/2008	288	70	130	4.82	36	2809.13
25/1/2008	314	72.5	139	5	37.5	2868.41
28/1/2008	304	70.5	135	4.96	35.5	2877.44
29/1/2008	310	70.5	139	4.98	36	2895.07
30/1/2008	312	73	142	5.1	35.75	2907.3
31/1/2008	326	76	147	5.2	37	2899.05
1/2/2008	338	77.5	152	5.5	39	2796.65
4/2/2008	328	77	148	5.5	39	2836.39
5/2/2008	326	77	148	5.5	39	2780.47
6/2/2008	316	76	144	5.35	37.75	2748.89

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
7/2/2008	310	74.5	141	5.35	37.75	2774.41
8/2/2008	318	76	144	5.45	38.5	2889.39
11/2/2008	316	76.5	145	5.4	37.75	2939.1
12/2/2008	324	78	148	5.45	38.5	2913.85
13/2/2008	330	78	151	5.4	38.75	2921.93
14/2/2008	332	77.5	153	5.45	39.25	2965.71
15/2/2008	328	77	154	5.4	39.25	2937.41
18/2/2008	326	78	151	5.35	39.25	2943.84
19/2/2008	332	79	157	5.4	40	3058.66
20/2/2008	332	78	158	5.25	40.25	3036.78
21/2/2008	332	78	158	5.25	40.25	2980.29
22/2/2008	328	78	154	5.35	41.5	2995.5
25/2/2008	336	78	158	5.5	42	2995.59
26/2/2008	334	78	156	5.55	41.5	3059.04
27/2/2008	334	77.5	155	5.7	41.25	2975.17
28/2/2008	340	78.5	160	6	42	3051.68
29/2/2008	342	79	161	6	42.25	2966.21
3/3/2008	336	78.5	158	6	42.25	3021.14
4/3/2008	330	77.5	153	5.9	42.25	2930.06
5/3/2008	322	76	152	5.9	41.75	3052.97
6/3/2008	324	76	152	6	42	3068.6
7/3/2008	324	76	153	5.95	41.5	3038.07
10/3/2008	320	75.5	151	5.9	41	3069.88
11/3/2008	330	72.5	158	6	41.5	3095.69
12/3/2008	338	73	160	6.1	41.5	3128.09
13/3/2008	332	72.5	156	6	41.5	3151.17
14/3/2008	334	72.5	158	5.75	42	3147.42
17/3/2008	328	71	158	5.6	38.5	2960.24
18/3/2008	324	73	157	5.75	39.25	3053.9
19/3/2008	320	71	154	5.85	38.5	2920.55
20/3/2008	314	68.5	151	5.75	37.5	2908.54
21/3/2008	312	68	150	5.75	37.5	2908.54

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
24/3/2008	312	68	151	5.8	37.5	2960.06
25/3/2008	322	68.5	154	5.85	38.25	3005.45
26/3/2008	316	68	153	5.85	37.75	3092.63
27/3/2008	320	68	154	5.85	38	3097.43
28/3/2008	322	70.5	153	5.8	38.25	3073.89
31/3/2008	316	70	151	5.75	37.75	2973.76
1/4/2008	320	69.5	153	5.75	38	2977.53
2/4/2008	320	69	152	5.75	37.75	3089.21
3/4/2008	320	70	151	5.75	37.75	3062.29
4/4/2008	318	70.5	152	5.75	37.75	3134.56
7/4/2008	318	70.5	152	5.75	37.75	3195.69
8/4/2008	320	71	154	5.75	37.75	3180.06
9/4/2008	318	70.5	156	5.75	37.75	3235.39
10/4/2008	316	70.5	153	5.75	37.5	3199.67
11/4/2008	318	71	157	5.75	37.5	3222.62
14/4/2008	318	71	157	5.75	37.5	3256.1
15/4/2008	318	71	157	5.75	37.5	3293.05
16/4/2008	322	72	160	5.75	38	3322.09
17/4/2008	332	76	166	5.85	39.25	3314.07
18/4/2008	334	76	166	5.85	39	3363.86
21/4/2008	334	75	164	5.9	38.5	3387.64
22/4/2008	346	76	171	6.1	39.25	3431.66
23/4/2008	338	74.5	169	5.9	38.25	3452.96
24/4/2008	334	72.5	167	5.9	37.75	3394.72
25/4/2008	332	73	167	5.8	37.5	3472.65
28/4/2008	340	73	172	5.85	37.75	3483.55
29/4/2008	338	72.5	169	5.8	37.25	3377.32
30/4/2008	334	71	166	5.8	37	3329.87
1/5/2008	334	71	166	5.8	37	3309.89
2/5/2008	340	73	169	5.8	37.25	3451.36
5/5/2008	340	73	169	5.8	37.25	3556.69
6/5/2008	344	71	174	5.85	36.75	3625.22

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
7/5/2008	348	70.5	179	5.8	36	3696.97
8/5/2008	352	70.5	185	5.7	35.5	3734.9
9/5/2008	352	69.5	185	5.55	34.25	3820.86
12/5/2008	346	68	189	5.4	32	3791.07
13/5/2008	340	68	183	5.4	31.5	3841.3
14/5/2008	346	67.5	188	5.6	31.75	3794.83
15/5/2008	352	68.5	186	5.7	32	3841.94
16/5/2008	366	70	192	5.55	32.5	3893.66
19/5/2008	366	70	192	5.55	32.5	3892.69
20/5/2008	376	70	198	5.45	31.25	3952.89
21/5/2008	380	69	208	5.55	31.25	4091.15
22/5/2008	372	67.5	208	5.4	29.5	3992.58
23/5/2008	372	67.5	200	5.5	29.75	4029.58
26/5/2008	360	62.5	194	5.1	28.25	4075.35
27/5/2008	354	63.5	193	5.15	28	3942.78
28/5/2008	340	61.5	184	5.05	26.25	4047.73
29/5/2008	340	59.5	189	5	25.5	3911.61
30/5/2008	336	64	187	5	27.5	3962.44
2/6/2008	322	59.5	180	4.9	25.75	3961.4
3/6/2008	322	59.5	179	4.96	26	3884.62
4/6/2008	322	59.5	178	4.98	26.5	3833.81
5/6/2008	324	60	177	4.98	27.25	4038.15
6/6/2008	332	60	184	4.9	26.5	4381.78
9/6/2008	330	59.5	184	4.84	26	4250.47
10/6/2008	324	58	179	4.7	25.25	4142.33
11/6/2008	320	58	181	4.66	25.5	4320.13
12/6/2008	326	57	183	4.6	25.75	4375.13
13/6/2008	320	56	182	4.64	25.25	4308.38
16/6/2008	316	56.5	178	4.7	25.25	4298.07
17/6/2008	312	55.5	173	4.38	24.9	4272.86
18/6/2008	302	53	170	4.24	24	4367.33
19/6/2008	292	50	169	3.9	22	4221.32

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
20/6/2008	308	57	176	4.1	23.8	4307.15
23/6/2008	308	57.5	182	4	23.5	4334.54
24/6/2008	300	55.5	184	3.96	23.2	4380.09
25/6/2008	306	56.5	189	4.02	23.5	4312.59
26/6/2008	306	55	183	4	23.6	4495.36
27/6/2008	308	53	188	4.04	23.3	4485.98
30/6/2008	302	52	193	4.06	23	4460.9
1/7/2008	302	52	193	4.06	23	4547.5
2/7/2008	304	52.5	191	3.96	22.6	4654.32
3/7/2008	298	51	181	3.88	22.1	4690.49
4/7/2008	298	51	182	3.86	22.1	4656.19
7/7/2008	290	50.5	174	3.7	21.7	4605.33
8/7/2008	282	52	169	3.64	20.9	4435.64
9/7/2008	286	52.5	164	3.62	21.7	4439.47
10/7/2008	290	54	163	3.78	22.1	4639.13
11/7/2008	298	53.5	165	4	21.6	4706.32
14/7/2008	286	51.5	166	3.94	21.3	4693.46
15/7/2008	270	51	160	3.9	20.9	4505.4
16/7/2008	250	50	150	3.8	20.1	4374.78
17/7/2008	250	50	150	3.8	20.1	4223.38
18/7/2008	238	50.5	143	3.98	20.3	4177.37
21/7/2008	260	52.5	149	4.02	20.7	4279.75
22/7/2008	264	51.5	147	3.98	20.2	4160.5
23/7/2008	264	50.5	146	4.06	20.7	4048.02
24/7/2008	266	48.5	145	4.1	21.2	4106.43
25/7/2008	262	48.5	150	3.98	20.8	4017.34
28/7/2008	254	49.25	156	4.08	21.4	4069.53
29/7/2008	244	49.75	152	4	21.5	3982.26
30/7/2008	236	49	145	4.02	21.4	4149.74
31/7/2008	250	49	150	4	21.3	4053.96
1/8/2008	246	49.25	149	4.02	21.6	4084.11
4/8/2008	246	49.25	150	3.98	21.5	3966.06

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
5/8/2008	236	50	142	3.92	22.4	3875.52
6/8/2008	240	50	145	3.96	23	3868.37
7/8/2008	264	54	156	4.12	24.9	3889.48
8/8/2008	256	53.5	150	4.02	25	3737.45
11/8/2008	266	52.5	149	4.08	25	3755.26
12/8/2008	266	52.5	149	4.08	25	3712.75
13/8/2008	264	52.5	142	4	25	3770.37
14/8/2008	268	51.5	148	4.02	24.6	3704.6
15/8/2008	270	52.5	148	4.02	25.5	3689.52
18/8/2008	272	51.5	144	4	24.6	3667.78
19/8/2008	270	51	147	4	23.4	3748.54
20/8/2008	268	51	148	3.98	23.6	3802.98
21/8/2008	258	49.5	145	3.98	22.5	3997.18
22/8/2008	264	50	150	4.06	22.2	3767.71
25/8/2008	260	49.75	146	4	21.7	3799.64
26/8/2008	258	48.75	143	4.04	20.9	3828.75
27/8/2008	258	49.5	147	4.08	21.4	3862.06
28/8/2008	264	49.75	149	4.1	21.4	3762.91
29/8/2008	266	49.75	149	4.1	21.6	3769.48
1/9/2008	262	49.25	146	4.06	21.3	3620.92
2/9/2008	250	48.75	140	4.02	21.3	3618.84
3/9/2008	240	46.75	134	3.96	21.3	3615.74
4/9/2008	246	46.75	135	3.96	21.4	3528.22
5/9/2008	240	46.5	132	3.98	21.4	3490.64
8/9/2008	248	48.25	139	4.08	21.7	3459.63
9/9/2008	248	48.25	138	4.08	21.8	3348.71
10/9/2008	246	47.5	136	4.16	22.3	3320.94
11/9/2008	240	46.5	134	4.1	22.3	3297.71
12/9/2008	244	47.25	137	4.26	22.9	3278.87
15/9/2008	238	46	134	4.22	21.5	3076.24
16/9/2008	228	44.5	129	4.08	21.2	2922.22
17/9/2008	214	43.75	122	4	20.5	3096.65

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
18/9/2008	214	42.5	126	3.96	20.4	3075.93
19/9/2008	228	44.25	136	4.08	21	3241.23
22/9/2008	228	43.5	134	4.1	20.4	3401.7
23/9/2008	228	43	137	4.04	20.4	3267.44
24/9/2008	236	43.75	137	4.12	20.8	3235.64
25/9/2008	238	43.75	136	4.12	21.4	3312.73
26/9/2008	236	43.75	136	4.12	21.1	3279.34
29/9/2008	230	41.75	130	4.06	20.6	2975.14
30/9/2008	228	41.5	127	4.06	20.7	3143.4
1/10/2008	224	40.75	126	4.04	20.2	3091.85
2/10/2008	228	40.5	127	4.06	20	2938.9
3/10/2008	226	40	124	4	19.6	2923.25
6/10/2008	202	36.75	110	3.8	18.2	2707.53
7/10/2008	195	34	106	3.62	16	2737.49
8/10/2008	183	30	100	3.06	13.5	2667.84
9/10/2008	192	30.5	107	3.04	14.2	2607.79
10/10/2008	170	27.25	96.5	2.86	12.5	2302.77
13/10/2008	182	29.75	104	3	13.2	2448.92
14/10/2008	190	32	110	3.08	13.8	2338.9
15/10/2008	181	29.25	105	2.98	13.3	2210.96
16/10/2008	179	29	103	2.92	13.3	2088.11
17/10/2008	177	27.75	97.5	2.86	12.9	2134.8
20/10/2008	181	28.5	101	2.98	13.1	2209.97
21/10/2008	183	28.75	104	2.94	12.9	2148.44
22/10/2008	177	27.25	98	2.9	12.5	1987.2
23/10/2008	177	27.25	98	2.9	12.5	2049.89
24/10/2008	162	24.2	90.5	2.84	11.2	1913.87
27/10/2008	141	21.4	75	2.1	9.4	1879.78
28/10/2008	148	19.8	81	2.22	9.5	1899.65
29/10/2008	140	18.8	75	2.08	9	2108.29
30/10/2008	153	19.3	85	2.2	9.5	1965.87
31/10/2008	159	20.6	86	2.26	9.95	2092.22

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
3/11/2008	177	22	98	2.38	10.4	1961.32
4/11/2008	183	22.5	99	2.5	10.8	2169.15
5/11/2008	183	22.1	99	2.38	10.3	2032.16
6/11/2008	183	23	102	2.64	10.6	1871.62
7/11/2008	182	22.8	101	2.52	10.9	1869.91
10/11/2008	180	22.5	101	2.44	10.4	1907.29
11/11/2008	171	21.7	96	2.38	9.95	1804.65
12/11/2008	167	22.1	95.5	2.26	10	1689.18
13/11/2008	166	21.8	96	2.12	9.7	1769.35
14/11/2008	164	21.6	96	2.08	9.6	1691.17
17/11/2008	168	21.8	96.5	2.14	9.35	1640.1
18/11/2008	159	20.8	91.5	2.16	8.7	1613.72
19/11/2008	150	19.6	87	2	8.1	1613.36
20/11/2008	142	18.9	84.5	1.89	7.6	1479.46
21/11/2008	141	19.1	84	1.92	7.5	1521.98
24/11/2008	137	18.5	80.5	1.77	7.2	1690.84
25/11/2008	138	18.9	82	1.84	7.25	1561.25
26/11/2008	143	19	85	1.97	7.45	1690.72
27/11/2008	140	18.7	85	1.83	7.4	1686.94
28/11/2008	147	19	93.5	1.87	7.7	1741.66
1/12/2008	144	18.2	91	1.8	7.4	1587.49
2/12/2008	143	18.3	91.5	1.83	7.3	1485.36
3/12/2008	144	18.6	98	1.83	7.35	1488.58
4/12/2008	144	19.3	99	1.81	7.4	1390.74
5/12/2008	144	19.3	99	1.81	7.4	1314.56
8/12/2008	154	19.8	104	1.87	7.65	1433.43
9/12/2008	168	22	106	2.06	8.45	1357.03
10/12/2008	168	22	106	2.06	8.45	1396.02
11/12/2008	172	23	104	2.08	8.75	1564.98
12/12/2008	172	23.1	105	2.04	9.1	1533.4
15/12/2008	177	26	109	2.24	10.4	1473.26
16/12/2008	180	25.25	110	2.26	11.1	1452.62

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
17/12/2008	177	24.5	109	2.14	10.4	1407.22
18/12/2008	180	25	108	2.2	10.6	1345
19/12/2008	176	24.2	104	2.2	10.1	1396.32
22/12/2008	168	22.8	100	2.14	9.7	1294.4
23/12/2008	171	23.3	103	2.18	10.2	1273.3
24/12/2008	171	23.3	102	2.14	9.75	1141.57
25/12/2008	172	23.3	103	2.16	9.75	1137.07
26/12/2008	172	23.5	102	2.16	9.8	1226.75
29/12/2008	173	23.4	103	2.14	9.75	1301.11
30/12/2008	175	23.6	107	2.16	9.8	1288.9
31/12/2008	175	23.6	107	2.16	9.8	1477.45
1/1/2009	175	23.6	107	2.16	9.8	1432.59
2/1/2009	175	23.6	107	2.16	9.8	1571.95
5/1/2009	189	26.75	123	2.28	11.2	1676.13
6/1/2009	184	25.75	120	2.26	10.9	1737.47
7/1/2009	181	25.25	116	2.22	10.6	1564.02
8/1/2009	183	25.75	115	2.2	11	1534.1
9/1/2009	177	24.5	113	2.12	10.6	1552.57
12/1/2009	168	23.4	108	2.1	10.1	1499.63
13/1/2009	156	22	100	1.98	9.7	1563.47
14/1/2009	158	22.4	104	1.98	10	1553.21
15/1/2009	154	21.5	99	1.89	9.6	1541.63
16/1/2009	159	22.2	103	1.92	9.7	1507.95
19/1/2009	158	22.4	103	1.92	9.65	1448.2
20/1/2009	157	22.1	101	1.92	9.4	1412.14
21/1/2009	156	23	99.5	1.94	9.4	1463.15
22/1/2009	162	23.9	102	1.94	9.65	1477.39
23/1/2009	159	23.3	99.5	1.93	9.4	1575.84
26/1/2009	160	23.5	101	1.92	9.5	1528.36
27/1/2009	165	25.25	101	2.02	10.2	1422.67
28/1/2009	167	25.5	101	2.02	10.4	1504.46
29/1/2009	159	24	97	1.93	9.6	1511.6

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
30/1/2009	160	24.5	99	1.93	9.8	1521.76
2/2/2009	154	23.4	97	1.88	9.55	1464.75
3/2/2009	155	23.6	97	1.88	9.65	1469.16
4/2/2009	154	24.1	97	1.88	10	1475.58
5/2/2009	155	24.2	97	1.89	9.9	1576.47
6/2/2009	165	25.5	100	1.92	10.4	1562.5
9/2/2009	165	25.5	100	1.92	10.4	1564.92
10/2/2009	163	26	99	1.91	10.4	1515.37
11/2/2009	163	25.75	99.5	1.9	10.1	1499.89
12/2/2009	160	25	96.5	1.89	9.95	1534.9
13/2/2009	164	26.25	96.5	1.89	10.1	1499.71
16/2/2009	163	27	97	1.92	10.5	1465.1
17/2/2009	159	26	93.5	1.88	10.1	1373.26
18/2/2009	159	26.25	93	1.9	10.1	1352.77
19/2/2009	159	26.25	93	1.92	10.2	1446.02
20/2/2009	156	25.5	91	1.91	9.9	1427.7
23/2/2009	157	25.75	91	1.88	10.1	1398
24/2/2009	156	26	89	1.88	10	1447.28
25/2/2009	158	25.75	90.5	1.9	10	1514.68
26/2/2009	155	24.3	89	1.88	10	1592
27/2/2009	156	24	89	1.87	10	1589.39
2/3/2009	151	22.7	83	1.84	9.35	1436.82
3/3/2009	150	23.1	83	1.81	9.25	1489.12
4/3/2009	150	23.8	84	1.79	9.25	1553.82
5/3/2009	145	23.1	85	1.82	8.75	1482.23
6/3/2009	146	23.5	86	1.79	8.85	1550.3
9/3/2009	141	23	84	1.76	8.7	1512.52
10/3/2009	146	23.7	91	1.77	8.95	1502.92
11/3/2009	144	23.5	91	1.78	8.6	1434.16
12/3/2009	144	23.9	91	1.76	8.6	1539.87
13/3/2009	150	25	97	1.82	8.8	1530.33
16/3/2009	149	25.5	95.5	1.89	8.7	1536.03

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
17/3/2009	147	25.5	94	1.89	8.7	1606.26
18/3/2009	148	26.25	95	1.88	8.7	1643.49
19/3/2009	149	26.5	95	1.9	8.75	1677.12
20/3/2009	151	26.5	97.5	1.92	9	1707.59
23/3/2009	160	27.5	98	1.94	9.55	1778
24/3/2009	161	27.25	97.5	1.91	9.4	1766.96
25/3/2009	160	26.75	99	1.91	9.35	1705.74
26/3/2009	161	26.5	99.5	1.91	9.35	1767.25
27/3/2009	160	26.5	100	1.92	9.5	1717.68
30/3/2009	152	25.25	96	1.9	9.05	1598.48
31/3/2009	152.5	25.5	97.25	1.89	9.15	1644.51
1/4/2009	151.5	25	95.25	1.9	9.05	1628.61
2/4/2009	158	27.25	98.25	1.95	9.9	1773.37
3/4/2009	162	27.25	99.5	1.98	9.75	1800.39
6/4/2009	162	27.25	99.5	1.98	9.75	1754.23
7/4/2009	160	26.75	96.5	1.9	9.55	1730.89
8/4/2009	160	27.25	97.25	1.96	9.7	1744.39
9/4/2009	161	27.25	96.75	2.2	10	1828.67
10/4/2009	165.5	29.75	99	2.4	11.1	1741.22
13/4/2009	165.5	29.75	99	2.4	11.1	1768.19
14/4/2009	165.5	29.75	99	2.4	11.1	1760.86
15/4/2009	165.5	29.75	99	2.4	11.1	1749.04
16/4/2009	163	29.5	98.5	2.52	11.7	1766.63
17/4/2009	169	30.5	100	2.66	12.9	1789.86
20/4/2009	178	31.75	102	2.72	13.3	1670.12
21/4/2009	176.5	31.5	100	2.78	13.4	1672.27
22/4/2009	173.5	30.5	96.75	2.66	13.1	1679.02
23/4/2009	176.5	31.5	98.25	2.88	14	1685.66
24/4/2009	180	32	99	2.98	14.9	1733.95
27/4/2009	182	31.5	99.25	2.86	14.5	1693.33
28/4/2009	181	30.75	98.25	2.84	14.2	1675.37
29/4/2009	185	31.75	101	2.9	14.6	1719.07

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
30/4/2009	189.5	32.25	103.5	2.84	14.4	1714.45
1/5/2009	189.5	32.25	103.5	2.84	14.4	1816.57
4/5/2009	199.5	33	109	2.88	14.7	1882.41
5/5/2009	199.5	33	109	2.88	14.7	1858.9
6/5/2009	212	34.75	111	3.06	15.7	1943.92
7/5/2009	212	34.75	117	3.04	15.4	1936.05
8/5/2009	212	34.75	117	3.04	15.4	1995.04
11/5/2009	220	37.25	117	3.22	17.1	1948.58
12/5/2009	220	38	119.5	3.3	19	1968.19
13/5/2009	222	42.25	124.5	3.86	19.4	1952.26
14/5/2009	208	38.25	115	3.8	18	1935.64
15/5/2009	209	37.75	117	3.68	17.7	1889.05
18/5/2009	209	39	118	3.66	18.2	1973.38
19/5/2009	218	40.25	127.5	3.78	19.2	1981.62
20/5/2009	220	41.25	129	3.8	19.2	2043.42
21/5/2009	214	39.5	123.5	3.64	18.4	2013.42
22/5/2009	215	40.5	125.5	3.78	19.2	2041.22
25/5/2009	212	40	123.5	3.68	19.8	2010.2
26/5/2009	210	39.5	120	3.66	19	2057.47
27/5/2009	218	40.5	125	3.74	19.5	2089.23
28/5/2009	217	40.25	125	3.72	19.7	2156.19
29/5/2009	220	40.75	130.5	3.7	19.8	2200.16
1/6/2009	232	43.25	143.5	3.82	21.3	2243.11
2/6/2009	227	41.5	137.5	3.72	20.4	2252.93
3/6/2009	226	41.25	138	3.68	20.3	2185.63
4/6/2009	229	42	139	3.7	20.8	2292.49
5/6/2009	231	42	141.5	3.78	20.7	2289.29
8/6/2009	229	41	139	3.7	20.2	2293.18
9/6/2009	231	41.5	141	3.72	20.4	2343.72
10/6/2009	244	42.5	145.5	3.8	21.1	2368.23
11/6/2009	251	42.75	145	3.86	20.7	2395.13
12/6/2009	258	42.5	146	3.86	20.5	2377.8

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
15/6/2009	247	40.5	140.5	3.7	19.9	2334.84
16/6/2009	239	38.75	136	3.62	18.9	2336.53
17/6/2009	234	37.5	132	3.48	18.5	2376.86
18/6/2009	225	36	128.5	3.26	17.8	2366.93
19/6/2009	234	37	134	3.36	18.5	2309.93
22/6/2009	228	35	129	3.26	17.6	2235.45
23/6/2009	222	33	123	3.14	17	2299.31
24/6/2009	228	34	127	3.2	17.7	2281.63
25/6/2009	235	34.75	130.5	3.24	18.5	2346.77
26/6/2009	237	35	133	3.26	18.5	2308.59
29/6/2009	237	35.25	132.5	3.32	18.4	2382.79
30/6/2009	234	35.5	133.5	3.24	18.1	2322.89
1/7/2009	234	35.5	133.5	3.24	18.1	2337.88
2/7/2009	229	33.5	129	3.16	17.5	2267.32
3/7/2009	227	33.5	127	3.16	17.4	2233.59
6/7/2009	227	33.5	127	3.16	17.4	2189.96
7/7/2009	227	33.5	127	3.16	17.4	2160.99
8/7/2009	222	32.25	124.5	3.08	16.9	2063.58
9/7/2009	227	32.5	125	3.1	17.2	2089.41
10/7/2009	216	30.5	119.5	3.02	16.5	2071.58
13/7/2009	215	30.75	122	3.02	16.6	2081.33
14/7/2009	222	33.25	126	3.08	17.1	2082.58
15/7/2009	223	34	127	3.24	17.8	2186.27
16/7/2009	221	33.5	126	3.2	17.8	2186.97
17/7/2009	222	35	129.5	3.3	18.7	2238.73
20/7/2009	237	37	136	3.44	20.1	2237.86
21/7/2009	233	36.25	138	3.44	19.7	2237.88
22/7/2009	226	34.75	134	3.32	19	2247.39
23/7/2009	232	36.5	138	3.4	19.7	2319.47
24/7/2009	233	36.75	139	3.44	19.8	2363.98
27/7/2009	236	37.25	139.5	3.46	19.8	2378.92
28/7/2009	238	38	139.5	3.44	19.8	2348.32

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
29/7/2009	235	37.25	135.5	3.38	19.4	2218.09
30/7/2009	240	37.5	138	3.42	19.8	2357.96
31/7/2009	239	37.5	138	3.42	19.6	2411.37
3/8/2009	248	39.25	142.5	3.48	20.1	2469.4
4/8/2009	250	39.25	141	3.42	19.6	2490.99
5/8/2009	248	39	141	3.42	19.6	2529.91
6/8/2009	256	40.75	144	3.48	20.6	2476.07
7/8/2009	251	40	142	3.4	20	2439.74
10/8/2009	251	40	141.5	3.38	19.8	2440.43
11/8/2009	250	39.25	140.5	3.38	19.7	2414.47
12/8/2009	250	39.25	140.5	3.38	19.7	2455.33
13/8/2009	254	40.25	143	3.5	20.4	2475.75
14/8/2009	250	40	142	3.48	20.1	2387.24
17/8/2009	235	37.75	136	3.32	19.1	2360.72
18/8/2009	237	38.75	140	3.34	19.5	2421.96
19/8/2009	232	38	137.5	3.3	19.2	2495.99
20/8/2009	236	39	140.5	3.38	19.8	2451.48
21/8/2009	237	39.5	141	3.4	20	2480.03
24/8/2009	244	40	142	3.44	20.5	2482.07
25/8/2009	247	40.25	143	3.44	20.5	2397.38
26/8/2009	246	40.75	142.5	3.84	21.2	2396.7
27/8/2009	244	40	139.5	3.78	21.2	2425.27
28/8/2009	247	40.75	142	3.9	21.6	2439.73
31/8/2009	244	40.5	138.5	3.84	21.7	2332.75
1/9/2009	243	39.25	139	3.84	21.8	2269.14
2/9/2009	238	39.5	138.5	3.84	21.8	2281
3/9/2009	240	40	140	3.86	22.1	2260.93
4/9/2009	240	41.25	139	4.14	23.2	2254.07
7/9/2009	245	42.75	141	4.4	24.8	2259.9
8/9/2009	253	45.75	143.5	4.34	25.25	2348.58
9/9/2009	260	46	146	4.32	26	2363.69
10/9/2009	264	47	147.5	4.28	26.5	2359.61

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
11/9/2009	265	47.25	148.5	4.32	26.5	2279.74
14/9/2009	257	44.5	143.5	4.1	25	2277.7
15/9/2009	265	46	145	4.34	26.5	2283.17
16/9/2009	266	46.25	146	4.36	26.5	2403.6
17/9/2009	265	45.75	146	4.3	25.75	2389.54
18/9/2009	266	46.25	146.5	4.34	26.25	2368.14
21/9/2009	264	46	145	4.3	26	2282.84
22/9/2009	267	46.75	146.5	4.54	27.25	2343.65
23/9/2009	268	46.75	150	4.48	27	2249.87
24/9/2009	265	46.25	147.5	4.52	26.25	2147.92
25/9/2009	262	46	146.5	4.56	26	2168.5
28/9/2009	257	45.5	145	4.44	25.25	2181.66
29/9/2009	259	45	144	4.42	25.5	2177.57
30/9/2009	262	45.25	144.5	4.34	24.4	2294.93
1/10/2009	263	45.5	145.5	4.36	24.7	2302.78
2/10/2009	261	45	145	4.34	24.5	2268.3
5/10/2009	258	44.25	143.5	4.26	24.1	2266.22
6/10/2009	264	45	145	4.38	25.5	2277.48
7/10/2009	268	46.25	146.5	4.36	25.5	2233.46
8/10/2009	267	46.5	147.5	4.38	25.75	2311.74
9/10/2009	269	46.5	152	4.36	25.5	2319.06
12/10/2009	270	46	155.5	4.34	25	2361.41
13/10/2009	273	45.5	155.5	4.28	25	2396.19
14/10/2009	267	44.75	155	4.18	24.4	2422.59
15/10/2009	255	41.5	148	3.8	22.6	2480.78
16/10/2009	262	43.5	154	3.92	23.7	2534.86
19/10/2009	265	44.75	162.5	4.14	24.5	2556.29
20/10/2009	261	44.25	159.5	4.2	24.2	2538.54
21/10/2009	256	43.5	156.5	4.08	23.9	2626.99
22/10/2009	255	43	155.5	4	23.3	2628.12
23/10/2009	255	43	155.5	4	23.3	2603.69
26/10/2009	258	44.25	156	4.04	23.4	2536.26

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
27/10/2009	257	44.75	155.5	4.08	23.4	2576.17
28/10/2009	251	43.75	151.5	3.98	22.7	2509.24
29/10/2009	243	42.25	146	3.94	21.9	2591.17
30/10/2009	240	41.25	145	3.84	21.3	2491.17
2/11/2009	233	40.75	137	3.8	21	2539.72
3/11/2009	228	40.25	130	3.76	21	2594.08
4/11/2009	236	42	134.5	3.88	21.7	2613.95
5/11/2009	234	40.75	134.5	3.82	21.3	2593.11
6/11/2009	243	42.5	137.5	3.96	22.8	2514.81
9/11/2009	252	44.5	140	4.14	24.1	2575.97
10/11/2009	248	43.25	139.5	4.04	23.4	2568.82
11/11/2009	250	44	144	4.16	23.9	2587.58
12/11/2009	236	41.75	136	3.96	22.8	2531.03
13/11/2009	236	42	135.5	3.96	22.7	2516.44
16/11/2009	238	43	138	4.02	23.5	2604.93
17/11/2009	239	42.75	136	3.98	23.1	2602.16
18/11/2009	239	42.5	137	4	23.3	2611.68
19/11/2009	233	41.75	134	3.9	23	2550.42
20/11/2009	231	41.5	131	3.9	22.8	2536.93
23/11/2009	229	41	129	3.88	22.7	2554.67
24/11/2009	221	40.25	126	3.76	21.6	2524.96
25/11/2009	229	41.5	132	3.9	23	2587.36
26/11/2009	223	40.25	128.5	3.8	22.1	2539.78
27/11/2009	222	39.75	127.5	3.72	21.9	2548.23
30/11/2009	224	39.5	130.5	3.72	21.9	2597.1
1/12/2009	237	42.25	138.5	4	23.9	2629.3
2/12/2009	225	40.75	132	4	23	2575.31
3/12/2009	227	41.75	135	4.3	23.8	2593.69
4/12/2009	222	41.5	134	4.4	23.4	2572.76
7/12/2009	222	41.5	134	4.4	23.4	2536.99
8/12/2009	221	41.25	131	4.38	23.6	2500.31
9/12/2009	221	41	131	4.3	23.4	2405.25

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
10/12/2009	221	41	131	4.3	23.4	2392.36
11/12/2009	222	41.25	135	4.32	23.4	2387.59
14/12/2009	225	41.75	136.5	4.24	23.4	2389.72
15/12/2009	227	41.5	135.5	4.28	23.5	2395.26
16/12/2009	228	42.5	139	4.4	24.1	2439.83
17/12/2009	228	42	138.5	4.34	23.8	2387.66
18/12/2009	227	41.75	139	4.36	23.8	2403.56
21/12/2009	229	41.75	141	4.34	24.2	2381.95
22/12/2009	234	42.5	143	4.4	24.7	2388.71
23/12/2009	240	43.25	144	4.44	25.25	2469.31
24/12/2009	238	43	143.5	4.38	25.25	2491.79
25/12/2009	241	43.25	145	4.38	25.5	2491.79
28/12/2009	244	43.5	146.5	4.44	26	2536.41
29/12/2009	250	43.75	150	4.46	26.25	2548.61
30/12/2009	246	42.75	147	4.38	25.5	2574.52
31/12/2009	246	42.75	147	4.38	25.5	2570.18
1/1/2010	246	42.75	147	4.38	25.5	2579.85
4/1/2010	245	42.75	146	4.36	25	2641.92
5/1/2010	244	43.75	147.5	4.34	24.9	2641.85
6/1/2010	245	44	149	4.38	25.25	2681.21
7/1/2010	244	43.75	147.5	4.36	25	2674.5
8/1/2010	246	44.25	148.5	4.36	25.5	2669.78
11/1/2010	249	45.75	150.5	4.46	26.5	2639.37
12/1/2010	247	45.5	148.5	4.44	26.5	2591.93
13/1/2010	246	45.5	149	4.44	26.75	2561.32
14/1/2010	247	45	149.5	4.46	27.25	2538.18
15/1/2010	247	44.75	148.5	4.58	27.5	2504.64
18/1/2010	247	44.75	149	4.76	27.25	2512.64
19/1/2010	242	43.5	146.5	4.68	26.5	2524.47
20/1/2010	238	43.5	144	4.74	26	2478.07
21/1/2010	231	42	140	4.56	25.5	2437.87
22/1/2010	229	41.5	137	4.52	25.25	2378.88

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
25/1/2010	226	41	136	4.5	25	2406.85
26/1/2010	222	40.25	132.5	4.36	24.5	2395.76
27/1/2010	217	40	129.5	4.3	23.8	2360.05
28/1/2010	220	40	131.5	4.26	23.9	2363.03
29/1/2010	223	40.75	132	4.36	24.6	2352.2
1/2/2010	224	40.75	135	4.42	24.7	2418.05
2/2/2010	219	40.25	134	4.36	24.2	2508.65
3/2/2010	225	41.75	138	4.44	25.25	2494.33
4/2/2010	222	41.5	133	4.38	24.5	2364.08
5/2/2010	218	40.75	132	4.28	24	2272.91
8/2/2010	217	40.25	131.5	4.28	24	2303.07
9/2/2010	214	40	130	4.26	23.9	2379.39
10/2/2010	216	40.25	131.5	4.22	23.8	2390.8
11/2/2010	220	41	132	4.3	24.4	2406.78
12/2/2010	221	41	132	4.28	24.2	2384.58
15/2/2010	216	40.25	129.5	4.2	23.8	2371.73
16/2/2010	216	40.5	130	4.22	24.1	2474.52
17/2/2010	218	40.25	132.5	4.22	24.4	2488.86
18/2/2010	218	40.75	132	4.22	24.3	2532.63
19/2/2010	224	41.75	134	4.22	25	2542.97
22/2/2010	227	41.5	135.5	4.24	25.5	2552.72
23/2/2010	233	42.5	136.5	4.32	26	2499.57
24/2/2010	231	42.5	135	4.36	25.5	2525.17
25/2/2010	231	43.25	135.5	4.4	26	2459.87
26/2/2010	232	43.25	135	4.4	26.75	2504.67
1/3/2010	232	43.25	135	4.4	26.75	2513.6
2/3/2010	241	44	138	4.5	27.25	2512.3
3/3/2010	242	44.25	140.5	4.46	25.75	2544.04
4/3/2010	236	43.25	139	4.56	25.75	2511.59
5/3/2010	231	43	138.5	4.44	26	2559.11
8/3/2010	235	42	140	4.3	24.9	2575.78
9/3/2010	237	41.5	138.5	4.32	24.9	2555.69

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
10/3/2010	237	43.25	137	4.32	25	2573.16
11/3/2010	237	45	139	4.36	25.5	2575.25
12/3/2010	240	45.25	138.5	4.4	25.75	2541.11
15/3/2010	240	45	138.5	4.36	25.5	2503.66
16/3/2010	246	46.25	142.5	4.5	26.25	2562.76
17/3/2010	250	46.5	148	4.6	26.75	2573.32
18/3/2010	247	45.5	146.5	4.54	26	2542.26
19/3/2010	251	46.75	148.5	4.62	27	2490.53
22/3/2010	249	48	147.5	4.64	28	2531.27
23/3/2010	256	50	150	4.86	30	2535.97
24/3/2010	256	50.5	150	4.8	29.5	2501.8
25/3/2010	254	49.25	147.5	4.8	29.5	2512.94
26/3/2010	251	48.25	146	4.7	28.25	2510.54
29/3/2010	247	46.5	143.5	4.64	28	2564.53
30/3/2010	255	48.75	148	4.76	29.25	2559.31
31/3/2010	262	50	148.5	4.66	28.75	2605.88
1/4/2010	270	52.5	151	4.78	30	2598.99
2/4/2010	271	51.5	152.5	4.76	29.75	2598.99
5/4/2010	273	52	152	4.78	29.75	2601.39
6/4/2010	273	52	152	4.78	29.75	2711.23
7/4/2010	279	52.25	153.5	4.72	29.5	2680.39
8/4/2010	267	49.25	147	4.6	28	2659.73
9/4/2010	269	50.25	148.5	4.62	28.25	2659.62
12/4/2010	256	47.5	146	4.46	27	2638.28
13/4/2010	256	47.5	146	4.46	27	2668.34
14/4/2010	256	47.5	146	4.46	27	2714.88
15/4/2010	256	47.5	146	4.46	27	2747.85
16/4/2010	247	45.25	144	4.36	25.75	2697.14
19/4/2010	245	44	141	4.18	25.25	2653.62
20/4/2010	260	49	147.5	4.36	27.5	2667.9
21/4/2010	255	48.25	145.5	4.26	26.75	2696.59
22/4/2010	256	47.75	148	4.3	26.75	2702.19

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
23/4/2010	253	47	147	4.28	26.75	2753.85
26/4/2010	258	48	149	4.36	28	2741.07
27/4/2010	256	47.5	150	4.38	27.5	2708
28/4/2010	250	46.5	148.5	4.28	26.75	2729.92
29/4/2010	251	46	149	4.32	27	2754.66
30/4/2010	257	47	152	4.42	27.75	2779.62
3/5/2010	257	47	152	4.42	27.75	2835.27
4/5/2010	269	50	157.5	4.64	29.5	2721.95
5/5/2010	269	50	157.5	4.64	29.5	2625.42
6/5/2010	263	48.75	153	4.74	28.75	2545.62
7/5/2010	256	47.75	148	4.68	28	2498.53
10/5/2010	258	48.75	150.5	4.76	28.75	2569.71
11/5/2010	254	47.75	147	4.74	28.5	2586.23
12/5/2010	255	47.75	148	4.78	28.75	2614.61
13/5/2010	252	46.75	146.5	4.7	28.25	2590.36
14/5/2010	254	47	146	4.76	29	2592.36
17/5/2010	248	45.75	144	4.54	28	2392.86
18/5/2010	249	46.75	145.5	4.6	28.25	2370.72
19/5/2010	251	47	146.5	4.68	28.75	2337.13
20/5/2010	251	47	146.5	4.68	28.75	2272.15
21/5/2010	251	47	146.5	4.68	28.75	2273.45
24/5/2010	242	45	143	4.52	27.5	2273.15
25/5/2010	233	42.5	138	4.24	25.25	2226.8
26/5/2010	237	43	142	4.26	25.5	2301.69
27/5/2010	242	43.5	142.5	4.32	26	2389.86
28/5/2010	242	43.5	142.5	4.32	26	2370.98
31/5/2010	246	45.5	145	4.38	26.5	2392.09
1/6/2010	241	44	144	4.32	25.5	2342.21
2/6/2010	244	43.75	145	4.38	26	2390.11
3/6/2010	248	45	147	4.44	26.25	2450.19
4/6/2010	251	44.75	147.5	4.4	26.25	2334.49
7/6/2010	246	44	143.5	4.32	25.5	2335.49

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
8/6/2010	243	43.75	143	4.3	25.25	2332.36
9/6/2010	245	44	144	4.32	25.5	2396.43
10/6/2010	245	43.75	145	4.3	25.25	2417.86
11/6/2010	244	43.5	144.5	4.3	25	2389.72
14/6/2010	246	43.75	144	4.24	25.25	2399.91
15/6/2010	245	43.75	143	4.2	25.25	2449.11
16/6/2010	251	44.25	146	4.24	26	2466.82
17/6/2010	251	44.25	148	4.24	26	2482.13
18/6/2010	252	44	146.5	4.26	25.75	2462.78
21/6/2010	257	45	149	4.32	26.25	2475.03
22/6/2010	255	44.5	149	4.28	26	2447.44
23/6/2010	254	43.75	148	4.26	26	2393.39
24/6/2010	250	43.5	144	4.2	25.5	2410.7
25/6/2010	250	43.75	143.5	4.18	25.5	2466.67
28/6/2010	254	45.25	146.5	4.18	26	2446.96
29/6/2010	250	44.75	144	4.18	25.5	2384.27
30/6/2010	246	44.25	143.5	4.14	25.25	2355.08
1/7/2010	246	44.25	143.5	4.14	25.25	2286.41
2/7/2010	246	43.75	143.5	4.14	25.25	2258.68
5/7/2010	244	43.75	144.5	4.1	25	2253.63
6/7/2010	250	43.25	146.5	4.14	25.25	2257.5
7/7/2010	247	42.75	144.5	4.12	24.9	2331.99
8/7/2010	247	42.75	145	4.16	25	2368.56
9/7/2010	248	43	143.5	4.18	25.25	2379.17
12/7/2010	246	43.25	144	4.18	25	2342.7
13/7/2010	247	43.5	144	4.16	25	2412.44
14/7/2010	246	43.5	144	4.18	25	2402.07
15/7/2010	246	43.5	143.5	4.2	25	2377.42
16/7/2010	246	43.25	143.5	4.16	25	2356.42
19/7/2010	247	42.75	144.5	4.1	24.5	2366.49
20/7/2010	246	42.25	144	4.04	23	2388.31
21/7/2010	245	41.25	144	3.84	22.1	2356.33

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
22/7/2010	242	40.5	141	3.82	22.6	2433.53
23/7/2010	247	41.5	142	3.8	23.2	2415.8
26/7/2010	247	41.5	142	3.8	23.2	2400
27/7/2010	255	44.25	147.5	3.9	24.4	2364.45
28/7/2010	256	44	149	3.9	23.9	2365.21
29/7/2010	256	44	149	3.9	23.5	2421.23
30/7/2010	254	44	149	3.88	23.3	2432.89
2/8/2010	257	45	151	3.92	23.5	2535
3/8/2010	258	45	153	3.9	23.4	2575.36
4/8/2010	259	45.5	153	3.92	23.5	2540
5/8/2010	261	45.25	153	3.92	23.2	2520.67
6/8/2010	259	44.75	152	3.92	23	2485.93
9/8/2010	256	44	152	3.94	23.3	2504.31
10/8/2010	251	43.75	148.5	3.9	23.1	2467.38
11/8/2010	250	43	148.5	3.86	23	2384.08
12/8/2010	250	43	148.5	3.86	23	2329.48
13/8/2010	250	43	148.5	3.86	23	2317.02
16/8/2010	255	42.25	148	3.84	22.6	2304.77
17/8/2010	257	43.5	148.5	3.84	22.8	2340.09
18/8/2010	260	44.25	150	3.94	23.7	2333.87
19/8/2010	266	44.5	151.5	4.02	23.8	2296.79
20/8/2010	266	44	150	4.06	23.8	2255.8
23/8/2010	264	44	148	4.06	23.7	2236.69
24/8/2010	258	43	143.5	4.02	23.4	2206.64
25/8/2010	257	43.25	143	3.98	23.4	2243.62
26/8/2010	258	43.25	142	3.98	23.2	2277.26
27/8/2010	258	44.75	141	4.04	23.4	2329.76
30/8/2010	263	44	141.5	4.02	23.4	2326.35
31/8/2010	265	44	143.5	4.02	23.4	2264.19
1/9/2010	271	43.75	142	4.04	23.7	2323.41
2/9/2010	269	43.75	142	3.96	23.4	2335.95
3/9/2010	291	46.75	145.5	4.14	25	2325.15

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
6/9/2010	302	49.5	146.5	4.1	25.5	2320.61
7/9/2010	292	49	144	4.02	25	2344.56
8/9/2010	289	49.25	144	4	25.75	2350.07
9/9/2010	285	48.5	147.5	4	25.75	2318.36
10/9/2010	288	50.75	146	4.06	26	2337.29
13/9/2010	291	51.75	147	4.08	26.75	2346.53
14/9/2010	282	49.5	145	4	25.5	2355.66
15/9/2010	281	50.5	145	4	25.5	2359.8
16/9/2010	284	50.75	143.5	4.02	25	2337.53
17/9/2010	285	50.5	143	4.02	25.25	2324.72
20/9/2010	284	50	142	4.04	25.25	2353.91
21/9/2010	287	51	144.5	4.06	25.75	2328.56
22/9/2010	293	50.5	145	4.1	26	2302.67
23/9/2010	291	50.5	146.5	4.08	25.75	2315.94
24/9/2010	290	50.25	147	4.1	26.5	2340.79
27/9/2010	294	51	151	4.12	26.25	2307.66
28/9/2010	292	50.25	149	4.1	26.25	2307.51
29/9/2010	293	51.75	152	4.18	27.5	2363.78
30/9/2010	297	52.75	154	4.16	27.5	2400.08
1/10/2010	297	54	158	4.4	27.75	2444.9
4/10/2010	297	56	160	4.24	27.5	2421.74
5/10/2010	297	55.5	160	4.28	27.75	2464.35
6/10/2010	302	56.75	170	4.3	28	2454.67
7/10/2010	300	55	166.5	4.3	27.5	2398.37
8/10/2010	302	53.5	164.5	4.24	26.75	2433.74
11/10/2010	306	55.75	170	4.26	27.5	2426.73
12/10/2010	304	55	169.5	4.28	27.5	2416.59
13/10/2010	309	55.25	172	4.36	28.5	2445.82
14/10/2010	313	55.75	173	4.44	29.75	2412.44
15/10/2010	313	56.75	174	4.44	30.75	2359.06
18/10/2010	308	54.5	169	4.32	29.25	2429.46
19/10/2010	310	55.5	170	4.34	29.25	2330.55

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
20/10/2010	307	54.25	168.5	4.38	29.25	2408.86
21/10/2010	305	53.75	170.5	4.36	29	2349.09
22/10/2010	304	54.5	171	4.32	29.25	2393.1
25/10/2010	304	54.5	171	4.32	29.25	2407.47
26/10/2010	305	54.5	171	4.34	30	2405.35
27/10/2010	300	53.75	168.5	4.32	29.25	2400.6
28/10/2010	302	52.75	171	4.28	29.25	2415.09
29/10/2010	303	53	171	4.24	29.75	2397.2
1/11/2010	309	55	179.5	4.3	32	2434.71
2/11/2010	308	56.5	179	4.36	33.75	2457.54
3/11/2010	314	57	180	4.32	33.25	2487.87
4/11/2010	331	58.5	183.5	4.38	34.75	2537.73
5/11/2010	342	59	187.5	4.7	34.75	2531.98
8/11/2010	342	62	191.5	4.82	36.25	2541.01
9/11/2010	338	63.75	190	4.8	35	2523.21
10/11/2010	337	64.25	192	4.72	36.75	2545.84
11/11/2010	333	61.75	188	4.6	35.5	2545.68
12/11/2010	329	61.5	182.5	4.46	35.25	2484.43
15/11/2010	332	62.25	182	4.46	36	2512.5
16/11/2010	321	58.5	177.5	4.36	34	2454.16
17/11/2010	316	59.75	177	4.32	35.5	2423.21
18/11/2010	321	61.5	180.5	4.4	35.5	2467.32
19/11/2010	323	62.75	181.5	4.42	36	2439.81
22/11/2010	326	65.25	183.5	4.48	37	2431.11
23/11/2010	322	66.5	180	4.4	37	2421.63
24/11/2010	310	67	171	4.5	37.75	2503.05
25/11/2010	302	67	168	4.6	36.25	2506.47
26/11/2010	303	65	168	4.54	36.25	2514.67
29/11/2010	314	67.75	171.5	4.62	38.5	2564.28
30/11/2010	309	67.25	167	4.62	38	2518.76
1/12/2010	313	68.5	168.5	4.98	38	2585.33
2/12/2010	321	69.5	173	5.3	39	2627.03

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
3/12/2010	321	69.5	173	5.1	38.5	2645
6/12/2010	321	69.5	173	5.1	38.5	2644.7
7/12/2010	329	71.25	175.5	5.3	38.75	2641.2
8/12/2010	323	69.75	177	5.05	38	2646.13
9/12/2010	324	72	179	5.3	38.25	2652.62
10/12/2010	324	72	179	5.3	38.25	2639.69
13/12/2010	326	74	177.5	5.35	39.25	2661.04
14/12/2010	324	75.75	177.5	5.85	39.25	2652.89
15/12/2010	320	80	173	6	41	2693.52
16/12/2010	320	74.75	168.5	5.8	39	2662.02
17/12/2010	320	72	172.5	5.5	37.5	2680.97
20/12/2010	318	72.75	169	5.2	36.25	2724.65
21/12/2010	323	73.75	170	5.35	36.5	2733.4
22/12/2010	320	75.5	169.5	5.6	36.75	2737.32
23/12/2010	319	75.5	167	5.55	37	2744.86
24/12/2010	318	75.5	165	5.7	37.75	2746.68
27/12/2010	318	75	166	5.8	37	2737.48
28/12/2010	320	77.25	169	6.3	38.5	2753.31
29/12/2010	320	77.75	167	6.25	38.5	2736.11
30/12/2010	320	78.25	168	6.5	38.25	2704.61
31/12/2010	320	78.25	168	6.5	38.25	2750.73
3/1/2011	320	78.25	168	6.5	38.25	2756.46
4/1/2011	330	79	167	6.35	38.5	2705.7
5/1/2011	332	79.5	168.5	6.35	38.25	2776.26
6/1/2011	332	75.75	166.5	6.05	36.75	2741.26
7/1/2011	322	73.25	164	5.9	36.25	2724.62
10/1/2011	318	71.75	157	6.2	36	2828.7
11/1/2011	319	71	153	6.05	35.25	2865.24
12/1/2011	329	72.75	158.5	5.95	35.75	2852.74
13/1/2011	333	76.25	163	6	37	2840.57
14/1/2011	332	74.75	164	5.95	36.75	2857.97
17/1/2011	328	72.75	164.5	5.85	36	2839.49

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
18/1/2011	334	73	165	5.75	36.75	2844.27
19/1/2011	342	75.5	167	5.95	38.5	2857.03
20/1/2011	339	74.25	163	5.8	38.5	2809.68
21/1/2011	339	73.25	161.5	5.6	37.25	2863.83
24/1/2011	321	71	154	5.25	35.5	2848.03
25/1/2011	323	68	155	5.2	34.5	2817.96
26/1/2011	337	69.75	159.5	5.6	36.75	2885.21
27/1/2011	344	70	160	5.4	37.25	2871.38
28/1/2011	342	69.75	158.5	5.3	37.5	2952.07
31/1/2011	335	68	160.5	5.05	37	2973.33
1/2/2011	338	66.5	164.5	4.84	36.75	3001.57
2/2/2011	344	68	167	5.05	38	3025.39
3/2/2011	345	69	168	5.15	38	3005.23
4/2/2011	345	69.75	178	5.2	38	2943.39
7/2/2011	339	72	176.5	5.2	39.25	2942.26
8/2/2011	337	73	174.5	5.35	39.25	2966.14
9/2/2011	330	71.25	172	5.2	38	3030.04
10/2/2011	320	69.25	164	5	37	2998.46
11/2/2011	316	69.25	167.5	5.05	36.75	2990.33
14/2/2011	324	69.75	171	5.15	37	3042.22
15/2/2011	326	69.25	168.5	5.15	38	2982.81
16/2/2011	329	72.5	172.5	5.3	39.75	3051.86
17/2/2011	334	74	174.5	5.4	40.5	3010.13
18/2/2011	334	74	174.5	5.4	40.5	3014.11
21/2/2011	331	73.75	173.5	5.35	40.5	3163.33
22/2/2011	333	73	174.5	5.25	39.75	3096.07
23/2/2011	339	74.5	180	5.6	39	3257.13
24/2/2011	340	72.25	184	5.5	37.25	3200.01
25/2/2011	343	74	179	5.6	37.5	3253.44
28/2/2011	337	73.75	182	5.55	37	3237.28
1/3/2011	339	75	182	5.55	37	3236.75
2/3/2011	334	74.75	180.5	5.75	36.25	3233.58

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
3/3/2011	332	74.25	176	5.7	36.25	3229.87
4/3/2011	333	74.5	178	5.75	36.5	3352.19
7/3/2011	342	75.5	182	5.95	37.25	3316.87
8/3/2011	348	75.75	186.5	5.9	37	3263.07
9/3/2011	344	75.5	184	5.85	37.25	3355.58
10/3/2011	346	76.75	185	5.75	36.75	3329.81
11/3/2011	343	77.75	180.5	5.7	36.5	3285.18
14/3/2011	349	81	181.5	6.1	37.75	3244.62
15/3/2011	338	80	177.5	5.9	37	3131.64
16/3/2011	339	80.75	178.5	6	37.5	3186.89
17/3/2011	336	80.5	181	6	37.5	3295.85
18/3/2011	337	80.5	180	6	37.75	3260.68
21/3/2011	343	81.25	181	6.05	38	3277.14
22/3/2011	342	80.5	179	5.85	37.5	3313.15
23/3/2011	345	80.5	182	5.9	37.5	3305.73
24/3/2011	347	80.75	182.5	5.85	37.5	3301.31
25/3/2011	348	84	182	5.85	37.5	3308.69
28/3/2011	346	83.5	181.5	5.9	37.25	3282.81
29/3/2011	346	84	181	5.85	37.75	3297.42
30/3/2011	352	84.75	182.5	5.9	38	3291.78
31/3/2011	354	83.25	180	5.75	37.25	3346.61
1/4/2011	357	85	184.5	5.95	39.75	3390.62
4/4/2011	368	86.75	193.5	6.1	41.25	3440.25
5/4/2011	368	86.5	192	6.25	40.75	3464.79
6/4/2011	368	86.5	192	6.25	40.75	3470.53
7/4/2011	377	86.5	196	6.45	41.75	3460
8/4/2011	376	84	196.5	6.3	42.5	3570.27
11/4/2011	368	82.5	193	6.15	42	3482.39
12/4/2011	371	83.25	191.5	6.3	42.5	3405.82
13/4/2011	371	83.25	191.5	6.3	42.5	3465.2
14/4/2011	371	83.25	191.5	6.3	42.5	3459.77
15/4/2011	371	83.25	191.5	6.3	42.5	3502.87

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
18/4/2011	375	82.75	189.5	6.2	43	3445.4
19/4/2011	377	82.75	188	6.2	43	3438.84
20/4/2011	384	84	191	6.25	42.5	3496.62
21/4/2011	383	85.5	192.5	6.2	41.75	3484.59
22/4/2011	380	85	190	6.35	41.25	3484.89
25/4/2011	379	86	188.5	6.3	41.75	3484.43
26/4/2011	376	85.75	185.5	6.35	42	3511.84
27/4/2011	377	85.75	187	6.3	41	3541.56
28/4/2011	373	84	188.5	6.2	40.5	3548.5
29/4/2011	375	84.5	185	6.2	41.25	3562.6
2/5/2011	375	84.5	185	6.2	41.25	3546.48
3/5/2011	364	81.25	181	5.9	39.75	3461.47
4/5/2011	361	81.5	178.5	6	40	3420.39
5/5/2011	361	81.5	178.5	6	40	3420.39
6/5/2011	347	77.25	170.5	5.7	38	3114.24
9/5/2011	358	79.5	175.5	5.95	39.25	3110.12
10/5/2011	361	80.25	175.5	6.1	39.5	3337.05
11/5/2011	368	83	178.5	6.25	40.75	3177.2
12/5/2011	360	81	174.5	6.1	40.25	3219.53
13/5/2011	361	80	174.5	6.1	39.75	3231.63
16/5/2011	361	80	174.5	6.1	39.75	3160.35
17/5/2011	361	80	174.5	6.1	39.75	3133.16
18/5/2011	362	78.75	176.5	6	39.25	3214.14
19/5/2011	366	78.5	178	5.95	39	3198.55
20/5/2011	361	77.5	179	5.85	38.75	3224.44
23/5/2011	352	76.25	173.5	5.7	37.75	3170.85
24/5/2011	352	77	173	5.85	37.25	3247.71
25/5/2011	348	75.5	170.5	5.75	37	3319.72
26/5/2011	352	76.5	171.5	5.8	38.75	3306.11
27/5/2011	354	77.75	172.5	5.75	39	3304.37
30/5/2011	358	80.5	178	5.85	39	3288.25
31/5/2011	354	80.75	177.5	5.85	38.25	3350.58

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
1/6/2011	350	79.25	179	5.7	37.75	3271.65
2/6/2011	347	76.75	177.5	5.7	37	3280.89
3/6/2011	347	75.5	176	5.7	37.25	3313.61
6/6/2011	343	74.5	174	5.55	36.75	3264.52
7/6/2011	339	73.75	170.5	5.55	36.5	3338.4
8/6/2011	330	71.25	169	5.5	35.75	3372.34
9/6/2011	333	72.5	169.5	5.55	35.25	3418.97
10/6/2011	334	73	168.5	5.5	35.25	3372.29
13/6/2011	331	73.5	165	5.45	36.25	3386.79
14/6/2011	339	74.75	172	5.6	37.25	3413.33
15/6/2011	334	74	170.5	5.45	37	3236.5
16/6/2011	332	72.25	168.5	5.25	36.5	3285.3
17/6/2011	330	70.5	166.5	5.25	36.5	3265.71
20/6/2011	329	70	165.5	5.2	36.25	3228.55
21/6/2011	334	72.5	170	5.45	37.75	3203.73
22/6/2011	330	73	167	5.35	37.75	3289.26
23/6/2011	329	72.5	165	5.25	37.25	3097.55
24/6/2011	334	72	166	5.35	37.25	3097.87
27/6/2011	324	71.25	163.5	5.25	36.25	3173.33
28/6/2011	324	71.25	166	5.2	36.5	3225.01
29/6/2011	333	73	168	5.25	37	3313.62
30/6/2011	335	74.5	171	5.35	37.5	3286.96
1/7/2011	335	74.5	171	5.35	37.5	3263.92
4/7/2011	351	78.75	178.5	5.7	39.5	3220.37
5/7/2011	347	77.5	177	5.6	39.25	3269.82
6/7/2011	340	76	174	5.45	39.75	3296.51
7/7/2011	339	76	177	5.5	40.5	3429.59
8/7/2011	335	74.25	178.5	5.6	41.75	3396.34
11/7/2011	331	72.5	177.5	5.5	40.75	3364.16
12/7/2011	329	71.75	176	5.3	40.25	3391.61
13/7/2011	332	73.5	178	5.4	40.75	3371.92
14/7/2011	334	73	181	5.35	40.75	3348.44

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
15/7/2011	334	73	181	5.35	40.75	3377.36
18/7/2011	338	73.75	183	5.45	40.75	3322.77
19/7/2011	340	74.25	184	5.65	40.75	3333.47
20/7/2011	346	75	182.5	5.65	40.75	3361.59
21/7/2011	349	75.5	183	5.65	40.25	3363.8
22/7/2011	352	78	185.5	5.9	41.25	3371.51
25/7/2011	350	78.5	182.5	5.9	41.75	3342.41
26/7/2011	348	77.5	184.5	5.75	41	3353.52
27/7/2011	351	78	185	5.85	42.25	3323.33
28/7/2011	351	78	185.5	5.8	42.25	3316.64
29/7/2011	347	76.75	184	5.75	42.5	3317.14
1/8/2011	350	78.75	185	5.85	42.75	3293.61
2/8/2011	348	78.75	184.5	5.7	42	3284.32
3/8/2011	343	78.25	181	5.65	41.5	3191.76
4/8/2011	340	78.25	176	5.55	41	3041.12
5/8/2011	330	73.75	167.5	5.3	38.75	3116.04
8/8/2011	322	72.25	168	5.25	38	2947.59
9/8/2011	311	68.5	161.5	5.05	37	2917.01
10/8/2011	317	69.5	163	5.15	37.75	3038.71
11/8/2011	315	70	160	5.1	37.5	3071.37
12/8/2011	315	70	160	5.1	37.5	3062.7
15/8/2011	327	70.5	164	5.3	37.5	3120.52
16/8/2011	323	69.75	163	5.2	37.25	3115.74
17/8/2011	332	70.75	166	5.4	38	3151.86
18/8/2011	329	70.5	167	5.25	37.5	3052.93
19/8/2011	318	68.25	161	5.05	36	3100.54
22/8/2011	315	67.75	165	5	35	3099.94
23/8/2011	316	65	165	4.92	33.5	3129.32
24/8/2011	315	64.75	165	4.76	32.75	3163.12
25/8/2011	309	63.5	164	4.64	31	3192.5
26/8/2011	317	63.75	164.5	4.58	32.75	3204.5
29/8/2011	329	67.75	170	4.76	34	3220.44

Date	PTT	TOP	PTTEP	IRPC	PTTAR	Crude Oil Price
30/8/2011	322	65.5	173	4.62	33	3287.68
31/8/2011	329	67	175	4.82	34.25	3292.8
1/9/2011	330	67	173.5	4.82	34.5	3270.27
2/9/2011	328	67	167	4.8	34	3210.83
5/9/2011	324	65	162.5	4.68	32.5	3131.65
6/9/2011	319	66	163.5	4.74	34	3133.75
7/9/2011	324	67.25	167.5	4.78	33.75	3319.8
8/9/2011	326	68.25	167	4.8	34.25	3278.26
9/9/2011	321	67.5	163	4.76	33.25	3214.38

ภาคผนวก ข

ผลการทดสอบความนิ่งของข้อมูล (Unit Root Test)

1. การทดสอบความนิ่งด้วยวิธี Augmented Dickey-Fuller

1.1 การทดสอบความนิ่งของราคาหลักทรัพย์ PTT

1.1.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTT ที่ระดับ 0

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.715819	0.4066
Test critical values:		
1% level	-2.567366	
5% level	-1.941152	
10% level	-1.616478	

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

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-29.69199	0.0000
Test critical values:		
1% level	-2.567368	
5% level	-1.941153	
10% level	-1.616478	

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

1.2.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTT ที่ระดับ 1

1.2 การทดสอบความนิ่งของราคาหลักทรัพย์ TOP

1.2.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ TOP ที่ระดับ 0

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.671556	0.2488
Test critical values:		
1% level	-3.967607	
5% level	-3.414487	
10% level	-3.129381	

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

1.2.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ TOP ที่ระดับ 1

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-31.13707	0.0000
Test critical values:		
1% level	-3.967617	
5% level	-3.414492	
10% level	-3.129383	

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

1.3 การทดสอบความนิ่งของราคาหลักทรัพย์ PTTEP

1.3.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTTEP ที่ระดับ 0

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.467438	0.3444
Test critical values:		
1% level	-3.967607	
5% level	-3.414487	
10% level	-3.129381	

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

1.3.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTTEP ที่ระดับ 1

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-31.67804	0.0000
Test critical values:		
1% level	-3.967617	
5% level	-3.414492	
10% level	-3.129383	

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

1.4 การทดสอบความนิ่งของราคาหลักทรัพย์ PTTAR

4.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTTAR ที่ระดับ 0

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.151234	0.0952
Test critical values:		
1% level	-3.967617	
5% level	-3.414492	
10% level	-3.129383	

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

1.4.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTTAR ที่ระดับ 1

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-30.83834	0.0000
Test critical values:		
1% level	-3.967627	
5% level	-3.414497	
10% level	-3.129386	

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

1.5 การทดสอบความนิ่งของราคาหลักทรัพย์ IRPC

1.5.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ IRPC ที่ระดับ 0

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.558598	0.2997
Test critical values:		
1% level	-3.967607	
5% level	-3.414487	
10% level	-3.129381	

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

1.5.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ IRPC ที่ระดับ 1

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-31.46622	0.0000
Test critical values:		
1% level	-3.967617	
5% level	-3.414492	
10% level	-3.129383	

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

1.6 การทดสอบความนิ่งของราคาน้ำมันดิบ

1.6.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาน้ำมันดิบ ที่ระดับ 0

Null Hypothesis: BAHT_BBL has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=21)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.303657	0.8863
Test critical values:		
1% level	-3.967617	
5% level	-3.414492	
10% level	-3.129383	

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

1.6.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาน้ำมันดิบ ที่ระดับ 1

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-34.93633	0.0000
Test critical values:		
1% level	-3.967617	
5% level	-3.414492	
10% level	-3.129383	

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

2. การทดสอบความนิ่งด้วยวิธี Phillips-Perron Test (1988)

2.1 การทดสอบความนิ่งของราคาหลักทรัพย์ PTT

2.1.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTT ที่ระดับ 0

Null Hypothesis: PTT has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 17 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.615225	0.2735
Test critical values:		
1% level	-3.967607	
5% level	-3.414487	
10% level	-3.129381	

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

Residual variance (no correction)	33.28392
HAC corrected variance (Bartlett kernel)	30.81178

2.1.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTT ที่ระดับ 1

Null Hypothesis: D(PTT) has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 20 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-29.79219	0.0000
Test critical values:		
1% level	-3.967617	
5% level	-3.414492	
10% level	-3.129383	

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

Residual variance (no correction)	33.44415
HAC corrected variance (Bartlett kernel)	26.30839

2.2 การทดสอบความนิ่งของราคาหลักทรัพย์ TOP

2.2.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ TOP ที่ระดับ 0

Null Hypothesis: TOP has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 11 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.691687	0.2403
Test critical values:		
1% level	-3.967607	
5% level	-3.414487	
10% level	-3.129381	

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

Residual variance (no correction)	1.688929
HAC corrected variance (Bartlett kernel)	1.523245

2.2.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ TOP ที่ระดับ 1

Null Hypothesis: D(TOP) has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 11 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-31.18098	0.0000
Test critical values:		
1% level	-3.967617	
5% level	-3.414492	
10% level	-3.129383	

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

Residual variance (no correction)	1.701381
HAC corrected variance (Bartlett kernel)	1.542332

2.3 การทดสอบความนิ่งของราคาหลักทรัพย์ PTTEP

2.3.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTTEP ที่ระดับ 0

Null Hypothesis: PTTEP has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 11 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.409831	0.3741
Test critical values:		
1% level	-3.967607	
5% level	-3.414487	
10% level	-3.129381	

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

Residual variance (no correction)	11.57180
HAC corrected variance (Bartlett kernel)	10.87107

2.3.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTTEP ที่ระดับ 1

Null Hypothesis: D(PTTEP) has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 13 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-31.76386	0.0000
Test critical values:		
1% level	-3.967617	
5% level	-3.414492	
10% level	-3.129383	

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

Residual variance (no correction)	11.60243
HAC corrected variance (Bartlett kernel)	10.40458

2.4 การทดสอบความนิ่งของราคาหลักทรัพย์ PTTAR

2.4.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTTAR ที่ระดับ 0

Null Hypothesis: PTTAR has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-3.132890	0.0992
Test critical values:		
1% level	-3.967617	
5% level	-3.414492	
10% level	-3.129383	

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

Residual variance (no correction)	0.517846
HAC corrected variance (Bartlett kernel)	0.548179

2.4.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTTAR ที่ระดับ 1

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

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-30.85097	0.0000
Test critical values:		
1% level	-3.967627	
5% level	-3.414497	
10% level	-3.129386	

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

Residual variance (no correction)	0.523307
HAC corrected variance (Bartlett kernel)	0.548227

2.5 การทดสอบความนิ่งของราคาหลักทรัพย์ IRPC

2.5.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ IRPC ที่ระดับ 0

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

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.557767	0.3001
Test critical values:		
1% level	-3.967607	
5% level	-3.414487	
10% level	-3.129381	

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

Residual variance (no correction)	0.012507
HAC corrected variance (Bartlett kernel)	0.012468

2.5.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ IRPC ที่ระดับ 1

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

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-31.46311	0.0000
Test critical values:		
1% level	-3.967617	
5% level	-3.414492	
10% level	-3.129383	

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

Residual variance (no correction)	0.012565
HAC corrected variance (Bartlett kernel)	0.012783

2.6 การทดสอบความนิ่งของราคาน้ำมันดิบ

2.6.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาน้ำมันดิบ ที่ระดับ 0

Null Hypothesis: BAHT_BBL has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-1.332745	0.8790
Test critical values:		
1% level	-3.967607	
5% level	-3.414487	
10% level	-3.129381	

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

Residual variance (no correction)	4526.565
HAC corrected variance (Bartlett kernel)	3879.864

2.6.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาน้ำมันดิบ ที่ระดับ 1

Null Hypothesis: D(BAHT_BBL) has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-34.84672	0.0000
Test critical values:		
1% level	-3.967617	
5% level	-3.414492	
10% level	-3.129383	

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

Residual variance (no correction)	4457.895
HAC corrected variance (Bartlett kernel)	4674.591

3. การทดสอบความนิ่งด้วยวิธี Elliott-Rothenberg-Stock Point-Optimal Test

3.1 การทดสอบความนิ่งของราคาหลักทรัพย์ PTT

3.1.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTT ที่ระดับ 0

Null Hypothesis: PTT has a unit root
 Exogenous: Constant, Linear Trend
 Lag length: 0 (Spectral OLS AR based on SIC, maxlag=21)
 Sample: 1/01/2008 9/09/2011
 Included observations: 964

	P-Statistic
Elliott-Rothenberg-Stock test statistic	51.51796
Test critical values:	
1% level	3.960000
5% level	5.620000
10% level	6.890000

*Elliott-Rothenberg-Stock (1996, Table 1)

HAC corrected variance (Spectral OLS autoregression)	33.28392
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3.1.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTT ที่ระดับ 1

Null Hypothesis: D(PTT) has a unit root
 Exogenous: Constant, Linear Trend
 Lag length: 0 (Spectral OLS AR based on SIC, maxlag=21)
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

	P-Statistic
Elliott-Rothenberg-Stock test statistic	0.293281
Test critical values: 1% level	3.960000
5% level	5.620000
10% level	6.890000
*Elliott-Rothenberg-Stock (1996, Table 1)	
HAC corrected variance (Spectral OLS autoregression)	33.44415

3.2 การทดสอบความนิ่งของราคาหลักทรัพย์ TOP

3.2.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ TOP ที่ระดับ 0

Null Hypothesis: TOP has a unit root
 Exogenous: Constant, Linear Trend
 Lag length: 0 (Spectral OLS AR based on SIC, maxlag=21)
 Sample: 1/01/2008 9/09/2011
 Included observations: 964

	P-Statistic
Elliott-Rothenberg-Stock test statistic	93.42922
Test critical values: 1% level	3.960000
5% level	5.620000
10% level	6.890000
*Elliott-Rothenberg-Stock (1996, Table 1)	
HAC corrected variance (Spectral OLS autoregression)	1.688929

3.2.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ TOP ที่ระดับ 1

Null Hypothesis: D(TOP) has a unit root
 Exogenous: Constant, Linear Trend
 Lag length: 0 (Spectral OLS AR based on SIC, maxlag=21)
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

	P-Statistic
Elliott-Rothenberg-Stock test statistic	0.251923
Test critical values: 1% level	3.960000
5% level	5.620000
10% level	6.890000
*Elliott-Rothenberg-Stock (1996, Table 1)	
HAC corrected variance (Spectral OLS autoregression)	1.701381

3.3 การทดสอบความนิ่งของราคาหลักทรัพย์ PTTEP

3.3.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTTEP ที่ระดับ 0

Null Hypothesis: PTTEP has a unit root
 Exogenous: Constant, Linear Trend
 Lag length: 0 (Spectral OLS AR based on SIC, maxlag=21)
 Sample: 1/01/2008 9/09/2011
 Included observations: 964

	P-Statistic
Elliott-Rothenberg-Stock test statistic	15.50313
Test critical values: 1% level	3.960000
5% level	5.620000
10% level	6.890000
*Elliott-Rothenberg-Stock (1996, Table 1)	
HAC corrected variance (Spectral OLS autoregression)	11.57180

3.3.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTTEP ที่ระดับ 1

Null Hypothesis: D(PTTEP) has a unit root
 Exogenous: Constant, Linear Trend
 Lag length: 0 (Spectral OLS AR based on SIC, maxlag=21)
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

	P-Statistic
Elliott-Rothenberg-Stock test statistic	0.431077
Test critical values: 1% level	3.960000
5% level	5.620000
10% level	6.890000
*Elliott-Rothenberg-Stock (1996, Table 1)	
HAC corrected variance (Spectral OLS autoregression)	11.60243

3.4 การทดสอบความนิ่งของราคาหลักทรัพย์ PTTAR

3.4.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTTAR ที่ระดับ 0

Null Hypothesis: PTTAR has a unit root
 Exogenous: Constant, Linear Trend
 Lag length: 0 (Spectral OLS AR based on SIC, maxlag=21)
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

	P-Statistic
Elliott-Rothenberg-Stock test statistic	101.0821
Test critical values: 1% level	3.960000
5% level	5.620000
10% level	6.890000
*Elliott-Rothenberg-Stock (1996, Table 1)	
HAC corrected variance (Spectral OLS autoregression)	0.517846

3.4.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ PTTAR ที่ระดับ 1

Null Hypothesis: D(PTTAR) has a unit root
 Exogenous: Constant, Linear Trend
 Lag length: 0 (Spectral OLS AR based on SIC, maxlag=21)
 Sample (adjusted): 1/03/2008 9/09/2011
 Included observations: 962 after adjustments

	P-Statistic
Elliott-Rothenberg-Stock test statistic	0.269482
Test critical values:	
1% level	3.960000
5% level	5.620000
10% level	6.890000
*Elliott-Rothenberg-Stock (1996, Table 1)	
HAC corrected variance (Spectral OLS autoregression)	0.523307

3.5 การทดสอบความนิ่งของราคาหลักทรัพย์ IRPC

3.5.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ IRPC ที่ระดับ 0

Null Hypothesis: IRPC has a unit root
 Exogenous: Constant, Linear Trend
 Lag length: 0 (Spectral OLS AR based on SIC, maxlag=21)
 Sample: 1/01/2008 9/09/2011
 Included observations: 964

	P-Statistic
Elliott-Rothenberg-Stock test statistic	48.36664
Test critical values:	
1% level	3.960000
5% level	5.620000
10% level	6.890000
*Elliott-Rothenberg-Stock (1996, Table 1)	
HAC corrected variance (Spectral OLS autoregression)	0.012507

3.5.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาหลักทรัพย์ IRPC ที่ระดับ 1

Null Hypothesis: D(IRPC) has a unit root
 Exogenous: Constant, Linear Trend
 Lag length: 0 (Spectral OLS AR based on SIC, maxlag=21)
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

	P-Statistic
Elliott-Rothenberg-Stock test statistic	0.337983
Test critical values: 1% level	3.960000
5% level	5.620000
10% level	6.890000
*Elliott-Rothenberg-Stock (1996, Table 1)	
HAC corrected variance (Spectral OLS autoregression)	0.012565

3.6 การทดสอบความนิ่งของราคาน้ำมันดิบ

3.6.1 ผลการทดสอบผลต่างของผลตอบแทนของราคาน้ำมันดิบ ที่ระดับ 0

Null Hypothesis: BAHT_BBL has a unit root
 Exogenous: Constant, Linear Trend
 Lag length: 1 (Spectral OLS AR based on SIC, maxlag=21)
 Sample: 1/01/2008 9/09/2011
 Included observations: 964

	P-Statistic
Elliott-Rothenberg-Stock test statistic	28.27075
Test critical values: 1% level	3.960000
5% level	5.620000
10% level	6.890000
*Elliott-Rothenberg-Stock (1996, Table 1)	
HAC corrected variance (Spectral OLS autoregression)	3571.701

3.6.2 ผลการทดสอบผลต่างของผลตอบแทนของราคาน้ำมันดิบ ที่ระดับ 1

Null Hypothesis: D(BAHT_BBL) has a unit root
 Exogenous: Constant, Linear Trend
 Lag length: 0 (Spectral OLS AR based on SIC, maxlag=21)
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

	P-Statistic
Elliott-Rothenberg-Stock test statistic	0.384566
Test critical values: 1% level	3.960000
5% level	5.620000
10% level	6.890000
*Elliott-Rothenberg-Stock (1996, Table 1)	
HAC corrected variance (Spectral OLS autoregression)	4457.895

ภาคผนวก ค

ผลการวิเคราะห์ความสัมพันธ์เชิงดุลยภาพระยะยาว (Traditional Cointegration) และ ผลการวิเคราะห์ความสัมพันธ์เชิงดุลยภาพระยะสั้น (Error Correction Model)

1. หลักทรัพย์ PTT

1.1 ผลการวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะยาว (Traditional Cointegration)

Dependent Variable: PTT
Method: Least Squares
Date: 11/08/11 Time: 10:05
Sample: 1/01/2008 9/09/2011
Included observations: 964

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	89.35631	5.348898	16.70556	0.0000
BBL	0.066435	0.001932	34.37787	0.0000
R-squared	0.551272	Mean dependent var		267.3532
Adjusted R-squared	0.550806	S.D. dependent var		62.19639
S.E. of regression	41.68524	Akaike info criterion		10.30024
Sum squared resid	1671628.	Schwarz criterion		10.31035
Log likelihood	-4962.718	Hannan-Quinn criter.		10.30409
F-statistic	1181.838	Durbin-Watson stat		0.024794
Prob(F-statistic)	0.000000			

Dependent Variable: LNPTT
Method: Least Squares
Date: 02/10/12 Time: 11:38
Sample: 1/01/2008 9/09/2011
Included observations: 964

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.417524	0.138246	-3.020162	0.0026
LNOILP	0.760484	0.017582	43.25383	0.0000
R-squared	0.660418	Mean dependent var		5.558617
Adjusted R-squared	0.660065	S.D. dependent var		0.252173
S.E. of regression	0.147027	Akaike info criterion		-0.994333
Sum squared resid	20.79541	Schwarz criterion		-0.984227
Log likelihood	481.2684	Hannan-Quinn criter.		-0.990485
F-statistic	1870.894	Durbin-Watson stat		0.037005
Prob(F-statistic)	0.000000			

1.2 ผลการทดสอบความนิ่งของค่าความคลาดเคลื่อน (Residual) โดยวิธี Phillips-Perron

Null Hypothesis: E1 has a unit root

Exogenous: None

Bandwidth: 15 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.631591	0.0083
Test critical values:		
1% level	-2.567366	
5% level	-1.941152	
10% level	-1.616478	

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

Residual variance (no correction)	42.66426
HAC corrected variance (Bartlett kernel)	31.16881

Phillips-Perron Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 11/08/11 Time: 10:06

Sample (adjusted): 1/02/2008 9/09/2011

Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.014684	0.005055	-2.904780	0.0038
R-squared	0.008569	Mean dependent var		-0.073878
Adjusted R-squared	0.008569	S.D. dependent var		6.563364
S.E. of regression	6.535182	Akaike info criterion		6.593315
Sum squared resid	41085.68	Schwarz criterion		6.598373
Log likelihood	-3173.681	Hannan-Quinn criter.		6.595241
Durbin-Watson stat	2.238666			

Null Hypothesis: ER1 has a unit root
 Exogenous: None
 Bandwidth: 13 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.846653	0.0043
Test critical values:		
1% level	-2.567366	
5% level	-1.941152	
10% level	-1.616478	

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

Residual variance (no correction)	0.000790
HAC corrected variance (Bartlett kernel)	0.000557

Phillips-Perron Test Equation
 Dependent Variable: D(ER1)
 Method: Least Squares
 Date: 02/10/12 Time: 11:56
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ER1(-1)	-0.020147	0.006168	-3.266206	0.0011
R-squared	0.010904	Mean dependent var		-0.000226
Adjusted R-squared	0.010904	S.D. dependent var		0.028282
S.E. of regression	0.028128	Akaike info criterion		-4.303090
Sum squared resid	0.761100	Schwarz criterion		-4.298033
Log likelihood	2072.938	Hannan-Quinn criter.		-4.301165
Durbin-Watson stat	2.274294			

1.3 ผลการวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะสั้น (Error Correction Model)

Dependent Variable: D(PTT)

Method: Least Squares

Date: 11/08/11 Time: 10:07

Sample (adjusted): 1/02/2008 9/09/2011

Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.061759	0.183006	-0.337470	0.7358
D(BBL)	0.017993	0.002735	6.578993	0.0000
E1(-1)	-0.005605	0.004423	-1.267393	0.0253
R-squared	0.043388	Mean dependent var		-0.057113
Adjusted R-squared	0.041395	S.D. dependent var		5.800374
S.E. of regression	5.679053	Akaike info criterion		6.314556
Sum squared resid	30961.57	Schwarz criterion		6.329728
Log likelihood	-3037.459	Hannan-Quinn criter.		6.320333
F-statistic	21.77076	Durbin-Watson stat		1.985724
Prob(F-statistic)	0.000000			

Dependent Variable: D(LNPTT)

Method: Least Squares

Date: 02/10/12 Time: 14:54

Sample (adjusted): 1/02/2008 9/09/2011

Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000179	0.000747	-0.239805	0.8105
D(LNOILP)	0.177566	0.027260	6.513669	0.0000
E1(-1)	-0.007125	0.005118	-1.392090	0.0642
R-squared	0.042694	Mean dependent var		-0.000164
Adjusted R-squared	0.040700	S.D. dependent var		0.023660
S.E. of regression	0.023173	Akaike info criterion		-4.688539
Sum squared resid	0.515513	Schwarz criterion		-4.673368
Log likelihood	2260.532	Hannan-Quinn criter.		-4.682762
F-statistic	21.40704	Durbin-Watson stat		1.999515
Prob(F-statistic)	0.000000			

2. หลักทรัพย์ TOP

2.1 ผลการวิเคราะห์ความสัมพันธ์เชิงคูลยภาพในระยะยาว (Traditional Cointegration)

Dependent Variable: TOP

Method: Least Squares

Date: 11/08/11 Time: 10:08

Sample: 1/01/2008 9/09/2011

Included observations: 964

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.325512	1.670259	1.392306	0.1642
BBL	0.018469	0.000603	30.60542	0.0000
R-squared	0.493335	Mean dependent var		51.80799
Adjusted R-squared	0.492809	S.D. dependent var		18.27747
S.E. of regression	13.01673	Akaike info criterion		7.972421
Sum squared resid	162996.7	Schwarz criterion		7.982527
Log likelihood	-3840.707	Hannan-Quinn criter.		7.976268
F-statistic	936.6916	Durbin-Watson stat		0.016175
Prob(F-statistic)	0.000000			

Dependent Variable: LNTOP

Method: Least Squares

Date: 02/10/12 Time: 14:56

Sample: 1/01/2008 9/09/2011

Included observations: 964

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.159273	0.214909	-24.00673	0.0000
LNOILP	1.150084	0.027332	42.07844	0.0000
R-squared	0.647954	Mean dependent var		3.878475
Adjusted R-squared	0.647588	S.D. dependent var		0.385013
S.E. of regression	0.228560	Akaike info criterion		-0.111962
Sum squared resid	50.25463	Schwarz criterion		-0.101856
Log likelihood	55.96578	Hannan-Quinn criter.		-0.108114
F-statistic	1770.595	Durbin-Watson stat		0.028153
Prob(F-statistic)	0.000000			

2.2 ผลการทดสอบความนิ่งของค่าความคลาดเคลื่อน (Residual) โดยวิธี Phillips-Perron

Null Hypothesis: E2 has a unit root

Exogenous: None

Bandwidth: 11 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.451108	0.0139
Test critical values:		
1% level	-2.567366	
5% level	-1.941152	
10% level	-1.616478	

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

Residual variance (no correction)	2.718633
HAC corrected variance (Bartlett kernel)	2.115306

Phillips-Perron Test Equation

Dependent Variable: D(E2)

Method: Least Squares

Date: 11/08/11 Time: 10:08

Sample (adjusted): 1/02/2008 9/09/2011

Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E2(-1)	-0.010619	0.004087	-2.598534	0.0095
R-squared	0.006754	Mean dependent var		-0.024391
Adjusted R-squared	0.006754	S.D. dependent var		1.655284
S.E. of regression	1.649685	Akaike info criterion		3.840083
Sum squared resid	2618.044	Schwarz criterion		3.845140
Log likelihood	-1848.000	Hannan-Quinn criter.		3.842009
Durbin-Watson stat	2.159113			

Null Hypothesis: E2 has a unit root
 Exogenous: None
 Bandwidth: 11 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.620863	0.0086
Test critical values:		
1% level	-2.567366	
5% level	-1.941152	
10% level	-1.616478	

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

Residual variance (no correction)	0.001456
HAC corrected variance (Bartlett kernel)	0.001075

Phillips-Perron Test Equation

Dependent Variable: D(E2)

Method: Least Squares

Date: 02/10/12 Time: 14:58

Sample (adjusted): 1/02/2008 9/09/2011

Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E2(-1)	-0.015784	0.005386	-2.930513	0.0035
R-squared	0.008765	Mean dependent var		-0.000351
Adjusted R-squared	0.008765	S.D. dependent var		0.038348
S.E. of regression	0.038180	Akaike info criterion		-3.691989
Sum squared resid	1.402295	Schwarz criterion		-3.686932
Log likelihood	1778.693	Hannan-Quinn criter.		-3.690064
Durbin-Watson stat	2.214374			

2.3 ผลการวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะสั้น (Error Correction Model)

Dependent Variable: D(TOP)
 Method: Least Squares
 Date: 11/08/11 Time: 10:10
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.020538	0.041648	-0.493127	0.6220
D(BBL)	0.003150	0.000622	5.066379	0.0000
E2(-1)	-0.002141	0.003220	-0.664772	0.0564
R-squared	0.026057	Mean dependent var		-0.019730
Adjusted R-squared	0.024028	S.D. dependent var		1.308240
S.E. of regression	1.292428	Akaike info criterion		3.354032
Sum squared resid	1603.554	Schwarz criterion		3.369203
Log likelihood	-1611.966	Hannan-Quinn criter.		3.359809
F-statistic	12.84178	Durbin-Watson stat		2.012415
Prob(F-statistic)	0.000003			

Dependent Variable: D(LNTOP)
 Method: Least Squares
 Date: 02/10/12 Time: 14:57
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000272	0.000883	-0.308150	0.7580
D(LNOILP)	0.177722	0.032279	5.505784	0.0000
E2(-1)	-0.000540	0.003899	-0.138469	0.0899
R-squared	0.030941	Mean dependent var		-0.000258
Adjusted R-squared	0.028922	S.D. dependent var		0.027807
S.E. of regression	0.027402	Akaike info criterion		-4.353305
Sum squared resid	0.720825	Schwarz criterion		-4.338133
Log likelihood	2099.116	Hannan-Quinn criter.		-4.347528
F-statistic	15.32569	Durbin-Watson stat		1.991958
Prob(F-statistic)	0.000000			

3. หลักทรัพย์ PTTEP

3.1 ผลการวิเคราะห์ความสัมพันธ์เชิงคูลยภาพในระยะยาว (Traditional Cointegration)

Dependent Variable: PTTEP

Method: Least Squares

Date: 11/08/11 Time: 10:10

Sample: 1/01/2008 9/09/2011

Included observations: 964

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	66.04917	2.206537	29.93341	0.0000
BBL	0.029965	0.000797	37.58774	0.0000
R-squared	0.594920	Mean dependent var		146.3327
Adjusted R-squared	0.594499	S.D. dependent var		27.00431
S.E. of regression	17.19607	Akaike info criterion		8.529311
Sum squared resid	284468.0	Schwarz criterion		8.539417
Log likelihood	-4109.128	Hannan-Quinn criter.		8.533159
F-statistic	1412.838	Durbin-Watson stat		0.045327
Prob(F-statistic)	0.000000			

Dependent Variable: LNPTTEP

Method: Least Squares

Date: 02/10/12 Time: 14:59

Sample: 1/01/2008 9/09/2011

Included observations: 964

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.177941	0.108776	1.635852	0.1022
LNOILP	0.609415	0.013834	44.05213	0.0000
R-squared	0.668572	Mean dependent var		4.966925
Adjusted R-squared	0.668227	S.D. dependent var		0.200843
S.E. of regression	0.115685	Akaike info criterion		-1.473822
Sum squared resid	12.87442	Schwarz criterion		-1.463716
Log likelihood	712.3823	Hannan-Quinn criter.		-1.469974
F-statistic	1940.591	Durbin-Watson stat		0.060155
Prob(F-statistic)	0.000000			

3.2 ผลการทดสอบความนิ่งของค่าความคลาดเคลื่อน (Residual) โดยวิธี Phillips-Perron

Null Hypothesis: E3 has a unit root

Exogenous: None

Bandwidth: 14 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.744356	0.0059
Test critical values:		
1% level	-2.567366	
5% level	-1.941152	
10% level	-1.616478	

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

Residual variance (no correction)	13.23577
HAC corrected variance (Bartlett kernel)	8.777674

Phillips-Perron Test Equation

Dependent Variable: D(E3)

Method: Least Squares

Date: 11/08/11 Time: 10:11

Sample (adjusted): 1/02/2008 9/09/2011

Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E3(-1)	-0.022802	0.006825	-3.341141	0.0009
R-squared	0.011466	Mean dependent var		-0.008600
Adjusted R-squared	0.011466	S.D. dependent var		3.661039
S.E. of regression	3.639990	Akaike info criterion		5.422877
Sum squared resid	12746.05	Schwarz criterion		5.427934
Log likelihood	-2610.115	Hannan-Quinn criter.		5.424803
Durbin-Watson stat	2.349076			

Null Hypothesis: E3 has a unit root

Exogenous: None

Bandwidth: 14 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-3.171475	0.0015
Test critical values:		
1% level	-2.567366	
5% level	-1.941152	
10% level	-1.616478	

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

Residual variance (no correction)	0.000792
HAC corrected variance (Bartlett kernel)	0.000530

Phillips-Perron Test Equation

Dependent Variable: D(E3)

Method: Least Squares

Date: 02/10/12 Time: 14:59

Sample (adjusted): 1/02/2008 9/09/2011

Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E3(-1)	-0.030168	0.007848	-3.844230	0.0001
R-squared	0.015126	Mean dependent var		-5.61E-05
Adjusted R-squared	0.015126	S.D. dependent var		0.028373
S.E. of regression	0.028158	Akaike info criterion		-4.300930
Sum squared resid	0.762746	Schwarz criterion		-4.295873
Log likelihood	2071.898	Hannan-Quinn criter.		-4.299005
Durbin-Watson stat	2.394457			

3.3 ผลการวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะสั้น (Error Correction Model)

Dependent Variable: D(PTTEP)
 Method: Least Squares
 Date: 11/08/11 Time: 10:11
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.003312	0.108315	-0.030580	0.9756
D(BBL)	0.008976	0.001618	5.545705	0.0000
E3(-1)	-0.013346	0.006344	-2.103636	0.0357
R-squared	0.033168	Mean dependent var		-0.001038
Adjusted R-squared	0.031154	S.D. dependent var		3.414838
S.E. of regression	3.361225	Akaike info criterion		5.265599
Sum squared resid	10845.92	Schwarz criterion		5.280770
Log likelihood	-2532.386	Hannan-Quinn criter.		5.271376
F-statistic	16.46668	Durbin-Watson stat		2.120243
Prob(F-statistic)	0.000000			

Dependent Variable: D(LNPTTEP)
 Method: Least Squares
 Date: 02/10/12 Time: 15:00
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.89E-05	0.000814	-0.023197	0.9815
D(LNOILP)	0.154876	0.029716	5.211910	0.0000
E3(-1)	-0.017797	0.007090	-2.510048	0.0122
R-squared	0.031166	Mean dependent var		-6.35E-06
Adjusted R-squared	0.029148	S.D. dependent var		0.025652
S.E. of regression	0.025275	Akaike info criterion		-4.514888
Sum squared resid	0.613275	Schwarz criterion		-4.499717
Log likelihood	2176.919	Hannan-Quinn criter.		-4.509111
F-statistic	15.44088	Durbin-Watson stat		2.170208
Prob(F-statistic)	0.000000			

4. หลักทรัพย์ PTTAR

4.1 ผลการวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะยาว (Traditional Cointegration)

Dependent Variable: PTTAR
 Method: Least Squares
 Date: 11/08/11 Time: 10:12
 Sample: 1/01/2008 9/09/2011
 Included observations: 964

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.810193	1.008166	2.787430	0.0054
BBL	0.008852	0.000364	24.30253	0.0000
R-squared	0.380399	Mean dependent var		26.52682
Adjusted R-squared	0.379755	S.D. dependent var		9.976280
S.E. of regression	7.856880	Akaike info criterion		6.962729
Sum squared resid	59384.81	Schwarz criterion		6.972835
Log likelihood	-3354.035	Hannan-Quinn criter.		6.966577
F-statistic	590.6131	Durbin-Watson stat		0.047603
Prob(F-statistic)	0.000000			

Dependent Variable: LNPTTAR
 Method: Least Squares
 Date: 02/10/12 Time: 15:01
 Sample: 1/01/2008 9/09/2011
 Included observations: 964

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.751884	0.296379	-22.78122	0.0000
LNOILP	1.264785	0.037693	33.55475	0.0000
R-squared	0.539255	Mean dependent var		3.187217
Adjusted R-squared	0.538776	S.D. dependent var		0.464127
S.E. of regression	0.315205	Akaike info criterion		0.530886
Sum squared resid	95.57874	Schwarz criterion		0.540992
Log likelihood	-253.8868	Hannan-Quinn criter.		0.534733
F-statistic	1125.921	Durbin-Watson stat		0.168367
Prob(F-statistic)	0.000000			

4.2 ผลการทดสอบความนิ่งของค่าความคลาดเคลื่อน (Residual) โดยวิธี Phillips-Perron

Null Hypothesis: E4 has a unit root

Exogenous: None

Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-4.517983	0.0000
Test critical values:		
1% level	-2.567366	
5% level	-1.941152	
10% level	-1.616478	

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

Residual variance (no correction)	2.876628
HAC corrected variance (Bartlett kernel)	3.079654

Phillips-Perron Test Equation

Dependent Variable: D(E4)

Method: Least Squares

Date: 11/08/11 Time: 10:12

Sample (adjusted): 1/02/2008 9/09/2011

Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E4(-1)	-0.030906	0.006964	-4.438172	0.0000
R-squared	0.019716	Mean dependent var		0.032294
Adjusted R-squared	0.019716	S.D. dependent var		1.713924
S.E. of regression	1.696944	Akaike info criterion		3.896573
Sum squared resid	2770.192	Schwarz criterion		3.901630
Log likelihood	-1875.200	Hannan-Quinn criter.		3.898498
Durbin-Watson stat	1.250760			

Null Hypothesis: E4 has a unit root

Exogenous: None

Bandwidth: 18 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-13.83724	0.0000
Test critical values:		
1% level	-2.567366	
5% level	-1.941152	
10% level	-1.616478	

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

Residual variance (no correction)	0.014672
HAC corrected variance (Bartlett kernel)	0.047416

Phillips-Perron Test Equation

Dependent Variable: D(E4)

Method: Least Squares

Date: 02/10/12 Time: 15:02

Sample (adjusted): 1/02/2008 9/09/2011

Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E4(-1)	-0.143317	0.012396	-11.56125	0.0000
R-squared	0.121335	Mean dependent var		0.003535
Adjusted R-squared	0.121335	S.D. dependent var		0.129288
S.E. of regression	0.121191	Akaike info criterion		-1.381858
Sum squared resid	14.12917	Schwarz criterion		-1.376801
Log likelihood	666.3645	Hannan-Quinn criter.		-1.379932
Durbin-Watson stat	0.970843			

4.3 ผลการวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะสั้น (Error Correction Model)

Dependent Variable: D(PTTAR)
 Method: Least Squares
 Date: 11/08/11 Time: 10:13
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.033579	0.053504	0.627595	0.5304
D(BBL)	0.003536	0.000797	4.437852	0.0000
E4(-1)	-0.027239	0.006836	-3.984802	0.0001
R-squared	0.033177	Mean dependent var		0.034528
Adjusted R-squared	0.031163	S.D. dependent var		1.686836
S.E. of regression	1.660345	Akaike info criterion		3.855038
Sum squared resid	2646.474	Schwarz criterion		3.870209
Log likelihood	-1853.201	Hannan-Quinn criter.		3.860815
F-statistic	16.47142	Durbin-Watson stat		1.175000
Prob(F-statistic)	0.000000			

Dependent Variable: D(LNPTTAR)
 Method: Least Squares
 Date: 02/10/12 Time: 15:02
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003586	0.003860	0.928979	0.3531
D(LNOILP)	0.576272	0.140351	4.105920	0.0000
E4(-1)	-0.138479	0.012291	-11.26668	0.0000
R-squared	0.125092	Mean dependent var		0.003639
Adjusted R-squared	0.123269	S.D. dependent var		0.127917
S.E. of regression	0.119774	Akaike info criterion		-1.403312
Sum squared resid	13.77195	Schwarz criterion		-1.388141
Log likelihood	678.6948	Hannan-Quinn criter.		-1.397535
F-statistic	68.62899	Durbin-Watson stat		0.914289
Prob(F-statistic)	0.000000			

5. หลักทรัพย์ IRPC

5.1 ผลการวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะยาว (Traditional Cointegration)

Dependent Variable: IRPC
 Method: Least Squares
 Date: 11/08/11 Time: 10:13
 Sample: 1/01/2008 9/09/2011
 Included observations: 964

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.093682	0.111390	9.818493	0.0000
BBL	0.001195	4.02E-05	29.69724	0.0000
R-squared	0.478287	Mean dependent var		4.295757
Adjusted R-squared	0.477745	S.D. dependent var		1.201221
S.E. of regression	0.868089	Akaike info criterion		2.557028
Sum squared resid	724.9426	Schwarz criterion		2.567134
Log likelihood	-1230.487	Hannan-Quinn criter.		2.560875
F-statistic	881.9261	Durbin-Watson stat		0.021733
Prob(F-statistic)	0.000000			

Dependent Variable: LNIRPC
 Method: Least Squares
 Date: 02/10/12 Time: 15:03
 Sample: 1/01/2008 9/09/2011
 Included observations: 964

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.244764	0.186234	-33.53186	0.0000
LNOILP	0.974056	0.023685	41.12548	0.0000
R-squared	0.637433	Mean dependent var		1.409694
Adjusted R-squared	0.637056	S.D. dependent var		0.328764
S.E. of regression	0.198063	Akaike info criterion		-0.398390
Sum squared resid	37.73826	Schwarz criterion		-0.388284
Log likelihood	194.0242	Hannan-Quinn criter.		-0.394543
F-statistic	1691.305	Durbin-Watson stat		0.033503
Prob(F-statistic)	0.000000			

5.2 ผลการทดสอบความนิ่งของค่าความคลาดเคลื่อน (Residual) โดยวิธี Phillips-Perron

Null Hypothesis: E5 has a unit root
 Exogenous: None
 Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.681324	0.0072
Test critical values:		
1% level	-2.567366	
5% level	-1.941152	
10% level	-1.616478	

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

Residual variance (no correction)	0.016236
HAC corrected variance (Bartlett kernel)	0.015662

Phillips-Perron Test Equation
 Dependent Variable: D(E5)
 Method: Least Squares
 Date: 11/08/11 Time: 10:14
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E5(-1)	-0.012851	0.004735	-2.714070	0.0068
R-squared	0.007368	Mean dependent var		-0.001953
Adjusted R-squared	0.007368	S.D. dependent var		0.127960
S.E. of regression	0.127488	Akaike info criterion		-1.280550
Sum squared resid	15.63559	Schwarz criterion		-1.275492
Log likelihood	617.5846	Hannan-Quinn criter.		-1.278624
Durbin-Watson stat	2.081194			

Null Hypothesis: E5 has a unit root
 Exogenous: None
 Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.931792	0.0033
Test critical values:		
1% level	-2.567366	
5% level	-1.941152	
10% level	-1.616478	

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

Residual variance (no correction)	0.001300
HAC corrected variance (Bartlett kernel)	0.001182

Phillips-Perron Test Equation
 Dependent Variable: D(E5)
 Method: Least Squares
 Date: 02/10/12 Time: 15:03
 Sample (adjusted): 1/02/2008 9/09/2011
 Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E5(-1)	-0.017928	0.005873	-3.052450	0.0023
R-squared	0.009484	Mean dependent var		-0.000379
Adjusted R-squared	0.009484	S.D. dependent var		0.036251
S.E. of regression	0.036079	Akaike info criterion		-3.805176
Sum squared resid	1.252227	Schwarz criterion		-3.800119
Log likelihood	1833.192	Hannan-Quinn criter.		-3.803250
Durbin-Watson stat	2.181872			

5.3 ผลการวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะสั้น (Error Correction Model)

Dependent Variable: D(IRPC)

Method: Least Squares

Date: 11/08/11 Time: 10:14

Sample (adjusted): 1/02/2008 9/09/2011

Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.001716	0.003579	-0.479346	0.6318
D(BBL)	0.000260	5.34E-05	4.867579	0.0000
E5(-1)	-0.006056	0.004143	-1.461703	0.0441
R-squared	0.025099	Mean dependent var		-0.001651
Adjusted R-squared	0.023068	S.D. dependent var		0.112364
S.E. of regression	0.111060	Akaike info criterion		-1.554375
Sum squared resid	11.84103	Schwarz criterion		-1.539204
Log likelihood	751.4317	Hannan-Quinn criter.		-1.548598
F-statistic	12.35749	Durbin-Watson stat		2.016505
Prob(F-statistic)	0.000005			

Dependent Variable: D(LNIRPC)

Method: Least Squares

Date: 02/10/12 Time: 15:04

Sample (adjusted): 1/02/2008 9/09/2011

Included observations: 963 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000310	0.000898	-0.345312	0.7299
D(LNOILP)	0.138741	0.032744	4.237118	0.0000
E5(-1)	-0.005770	0.004564	-1.264435	0.0264
R-squared	0.019043	Mean dependent var		-0.000299
Adjusted R-squared	0.016999	S.D. dependent var		0.028120
S.E. of regression	0.027880	Akaike info criterion		-4.318672
Sum squared resid	0.746226	Schwarz criterion		-4.303501
Log likelihood	2082.441	Hannan-Quinn criter.		-4.312896
F-statistic	9.318132	Durbin-Watson stat		2.034204
Prob(F-statistic)	0.000098			

ภาคผนวก ง

ผลการทดสอบสมมติฐานเชิงเป็นเหตุเป็นผล (Granger Causality Test)

กรณีศึกษาความสัมพันธ์เชิงดุลยภาพระยะยาวด้วยวิธี Traditional Cointegration

1. หลักทรัพย์ PTT

1.1 ผลการเลือกช่วงเวลาที่เหมาะสม

VAR Lag Order Selection Criteria

Endogenous variables: LNOILP LNPTT

Exogenous variables: C

Date: 02/17/12 Time: 10:15

Sample: 1/01/2008 9/09/2011

Included observations: 956

Lag	LogL	LR	FPE	AIC	SC	HQ
0	374.8251	NA	0.001572	-0.779969	-0.769796	-0.776094
1	4330.905	7887.330	4.03e-07	-9.047918	-9.017399	-9.036293
2	4355.188	48.31281	3.87e-07	-9.090352	-9.039486*	-9.070977
3	4366.343	22.14569	3.81e-07	-9.105320	-9.034108	-9.078195*
4	4371.557	10.33106	3.80e-07	-9.107861	-9.016302	-9.072986
5	4375.793	8.373100	3.80e-07*	-9.108353*	-8.996448	-9.065729
6	4377.915	4.186443	3.81e-07	-9.104424	-8.972173	-9.054050
7	4383.165	10.33595*	3.80e-07	-9.107040	-8.954443	-9.048916
8	4385.017	3.638103	3.82e-07	-9.102546	-8.929603	-9.036672

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

1.2 ผลการทดสอบความเป็นเหตุเป็นผล

Pairwise Granger Causality Tests

Date: 03/26/12 Time: 13:09

Sample: 1/01/2008 9/09/2011

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LNOILP does not Granger Cause LNPTT	962	11.3865	1.E-05
LNPTT does not Granger Cause LNOILP		7.25622	0.0007

2. หลักทรัพย์ TOP

2.1 ผลการเลือกช่วงเวลาที่เหมาะสม

VAR Lag Order Selection Criteria

Endogenous variables: LNOILP LNTOP

Exogenous variables: C

Date: 02/17/12 Time: 10:19

Sample: 1/01/2008 9/09/2011

Included observations: 956

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-43.24554	NA	0.003768	0.094656	0.104829	0.098531
1	4169.669	8399.389	5.65e-07	-8.710605	-8.680086*	-8.698981
2	4180.477	21.50123	5.57e-07	-8.724846	-8.673981	-8.705472
3	4189.231	17.38140*	5.52e-07*	-8.734794*	-8.663582	-8.707669*
4	4192.272	6.023885	5.53e-07	-8.732786	-8.641228	-8.697912
5	4195.187	5.762358	5.54e-07	-8.730516	-8.618611	-8.687892
6	4197.655	4.870367	5.56e-07	-8.727312	-8.595062	-8.676938
7	4199.430	3.492849	5.58e-07	-8.722656	-8.570059	-8.664532
8	4202.348	5.733175	5.60e-07	-8.720394	-8.547450	-8.654520

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

2.2 ผลการทดสอบความเป็นเหตุเป็นผล

Pairwise Granger Causality Tests

Date: 03/26/12 Time: 13:13

Sample: 1/01/2008 9/09/2011

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
LNOILP does not Granger Cause LNTOP	963	3.21139	0.0734
LNTOP does not Granger Cause LNOILP		16.4903	5.E-05

3. หลักทรัพย์ PTTEP

3.1 ผลการเลือกช่วงเวลาที่เหมาะสม

VAR Lag Order Selection Criteria

Endogenous variables: LNOILP LNPTTEP

Exogenous variables: C

Date: 02/17/12 Time: 10:26

Sample: 1/01/2008 9/09/2011

Included observations: 956

Lag	LogL	LR	FPE	AIC	SC	HQ
0	597.5565	NA	0.000986	-1.245934	-1.235761	-1.242059
1	4246.251	7274.489	4.81e-07	-8.870817	-8.840298	-8.859192
2	4287.765	82.59379	4.45e-07	-8.949298	-8.898433	-8.929924
3	4303.378	30.99840	4.34e-07	-8.973595	-8.902383*	-8.946470*
4	4307.719	8.599732	4.34e-07	-8.974307	-8.882749	-8.939433
5	4310.197	4.900054	4.35e-07	-8.971124	-8.859220	-8.928500
6	4314.072	7.643565	4.36e-07	-8.970862	-8.838611	-8.920488
7	4319.728	11.13464*	4.34e-07*	-8.974326*	-8.821729	-8.916202
8	4320.371	1.262418	4.37e-07	-8.967303	-8.794359	-8.901429

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

3.2 ผลการทดสอบความเป็นเหตุเป็นผล

Pairwise Granger Causality Tests

Date: 03/26/12 Time: 13:13

Sample: 1/01/2008 9/09/2011

Lags: 3

Null Hypothesis:	Obs	F-Statistic	Prob.
LNOILP does not Granger Cause LNPTTEP	961	21.3090	2.E-13
LNPTTEP does not Granger Cause LNOILP		9.33574	4.E-06

4. หลักทรัพย์ PTTAR

4.1 ผลการเลือกช่วงเวลาที่เหมาะสม

VAR Lag Order Selection Criteria

Endogenous variables: LNOILP LNPTTAR

Exogenous variables: C

Date: 02/17/12 Time: 10:32

Sample: 1/01/2008 9/09/2011

Included observations: 956

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-293.6057	NA	0.006363	0.618422	0.628595	0.622297
1	4085.496	8730.718	6.74e-07	-8.534509	-8.503990*	-8.522885
2	4094.251	17.41925	6.67e-07	-8.544458	-8.493592	-8.525083
3	4107.298	25.90400*	6.55e-07	-8.563386	-8.492174	-8.536261*
4	4111.911	9.137770	6.54e-07*	-8.564667*	-8.473109	-8.529792
5	4114.485	5.088784	6.56e-07	-8.561684	-8.449779	-8.519059
6	4117.811	6.561603	6.57e-07	-8.560274	-8.428023	-8.509899
7	4119.861	4.035477	6.59e-07	-8.556194	-8.403597	-8.498070
8	4121.808	3.825777	6.62e-07	-8.551900	-8.378957	-8.486026

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

4.2 ผลการทดสอบความเป็นเหตุเป็นผล

Pairwise Granger Causality Tests

Date: 03/26/12 Time: 13:14

Sample: 1/01/2008 9/09/2011

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
LNOILP does not Granger Cause LNPTTAR	963	63.3035	5.E-15
LNPTTAR does not Granger Cause LNOILP		6.23241	0.0127

5. หลักทรัพย์ IRPC

5.1 ผลการเลือกช่วงเวลาที่เหมาะสม

VAR Lag Order Selection Criteria

Endogenous variables: LNOILP LNIRPC

Exogenous variables: C

Date: 02/17/12 Time: 10:43

Sample: 1/01/2008 9/09/2011

Included observations: 956

Lag	LogL	LR	FPE	AIC	SC	HQ
0	88.58637	NA	0.002860	-0.181143	-0.170970	-0.177268
1	4148.911	8095.165	5.90e-07	-8.667177	-8.636658*	-8.655552
2	4157.091	16.27455	5.85e-07	-8.675922	-8.625056	-8.656547
3	4170.435	26.49237	5.74e-07*	-8.695470*	-8.624258	-8.668345*
4	4171.081	1.280936	5.78e-07	-8.688454	-8.596896	-8.653580
5	4175.929	9.583638	5.77e-07	-8.690227	-8.578323	-8.647603
6	4182.211	12.39279*	5.74e-07	-8.695001	-8.562750	-8.644627
7	4185.756	6.979522	5.74e-07	-8.694050	-8.541453	-8.635926
8	4189.160	6.687814	5.75e-07	-8.692804	-8.519861	-8.626930

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

5.2 ผลการทดสอบความเป็นเหตุเป็นผล

Pairwise Granger Causality Tests

Date: 03/26/12 Time: 13:15

Sample: 1/01/2008 9/09/2011

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
LNOILP does not Granger Cause LNIRPC	963	4.03910	0.0433
LNIRPC does not Granger Cause LNOILP		10.6122	0.0012

ภาคผนวก จ

ผลการวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะยาวด้วยวิธี Threshold Cointegration และผล
การวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะสั้นด้วยวิธี

Threshold Error Correction Model (TECM)

1. หลักทรัพย์ PTT

1.1 การวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะยาวด้วยวิธี Threshold Cointegration

1) Upper Regime

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 15:54

Sample (adjusted): 3 404

Included observations: 402 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.146889	0.300635	-0.488594	0.6254
E1(-1)	0.871263	0.049793	17.49765	0.0000
E1(-2)	0.048874	0.049231	0.992742	0.3214
R-squared	0.848266	Mean dependent var		-0.210364
Adjusted R-squared	0.847506	S.D. dependent var		15.42999
S.E. of regression	6.025492	Akaike info criterion		6.437310
Sum squared resid	14486.31	Schwarz criterion		6.467134
Log likelihood	-1290.899	Hannan-Quinn criter.		6.449118
F-statistic	1115.302	Durbin-Watson stat		2.007519
Prob(F-statistic)	0.000000			

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:27

Sample (adjusted): 3 817

Included observations: 815 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000245	0.000937	-0.261603	0.7937
E1(-1)	0.846887	0.034776	24.35251	0.0000
E1(-2)	0.115418	0.034685	3.327654	0.0009
R-squared	0.920896	Mean dependent var		-0.000415
Adjusted R-squared	0.920701	S.D. dependent var		0.095009
S.E. of regression	0.026754	Akaike info criterion		-4.400556
Sum squared resid	0.581231	Schwarz criterion		-4.383243
Log likelihood	1796.226	Hannan-Quinn criter.		-4.393911
F-statistic	4726.483	Durbin-Watson stat		2.004713
Prob(F-statistic)	0.000000			

2) Lower Regime

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 15:57

Sample (adjusted): 3 560

Included observations: 558 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.032827	0.251698	-0.130420	0.8963
E1(-1)	0.869752	0.042471	20.47856	0.0000
E1(-2)	0.102931	0.042362	2.429784	0.0154
R-squared	0.945593	Mean dependent var		-0.208229
Adjusted R-squared	0.945397	S.D. dependent var		25.44314
S.E. of regression	5.945357	Akaike info criterion		6.408460
Sum squared resid	19617.73	Schwarz criterion		6.431709
Log likelihood	-1784.960	Hannan-Quinn criter.		6.417540
F-statistic	4822.976	Durbin-Watson stat		1.971052
Prob(F-statistic)	0.000000			

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:29

Sample (adjusted): 3 147

Included observations: 145 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000965	0.003066	-0.314821	0.7534
E1(-1)	0.675451	0.083065	8.131572	0.0000
E1(-2)	0.107612	0.082033	1.311814	0.1917
R-squared	0.603798	Mean dependent var		-0.001819
Adjusted R-squared	0.598217	S.D. dependent var		0.058235
S.E. of regression	0.036913	Akaike info criterion		-3.740026
Sum squared resid	0.193486	Schwarz criterion		-3.678438
Log likelihood	274.1519	Hannan-Quinn criter.		-3.715000
F-statistic	108.2013	Durbin-Watson stat		1.948223
Prob(F-statistic)	0.000000			

1.2 ผลการทดสอบความนิ่งของค่าความคลาดเคลื่อน (Residual) โดยวิธี ADF

1) Upper Regime

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=17)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.637637	0.0000
Test critical values:		
1% level	-2.570713	
5% level	-1.941611	
10% level	-1.616172	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 02/13/12 Time: 15:55

Sample (adjusted): 2 404

Included observations: 403 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.089090	0.019210	-4.637637	0.0000
R-squared	0.050057	Mean dependent var		-0.171368
Adjusted R-squared	0.050057	S.D. dependent var		6.196361
S.E. of regression	6.039285	Akaike info criterion		6.436927
Sum squared resid	14662.13	Schwarz criterion		6.446849
Log likelihood	-1296.041	Hannan-Quinn criter.		6.440855
Durbin-Watson stat	2.068692			

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 1 (Automatic - based on SIC, maxlag=20)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.791261	0.0002
Test critical values:		
1% level	-2.567802	
5% level	-1.941212	
10% level	-1.616438	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 02/13/12 Time: 16:27

Sample (adjusted): 3 817

Included observations: 815 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.037692	0.009942	-3.791261	0.0002
D(E1(-1))	-0.115326	0.034663	-3.327080	0.0009
R-squared	0.034797	Mean dependent var		-0.000205
Adjusted R-squared	0.033609	S.D. dependent var		0.027200
S.E. of regression	0.026739	Akaike info criterion		-4.402925
Sum squared resid	0.581280	Schwarz criterion		-4.391384
Log likelihood	1796.192	Hannan-Quinn criter.		-4.398495
Durbin-Watson stat	2.004731			

2) Lower Regime

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=18)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.861640	0.0042
Test critical values:		
1% level	-2.569105	
5% level	-1.941391	
10% level	-1.616319	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 02/13/12 Time: 15:58

Sample (adjusted): 2 560

Included observations: 559 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.028316	0.009895	-2.861640	0.0044
R-squared	0.014462	Mean dependent var		-0.007587
Adjusted R-squared	0.014462	S.D. dependent var		6.021376
S.E. of regression	5.977678	Akaike info criterion		6.415729
Sum squared resid	19938.81	Schwarz criterion		6.423468
Log likelihood	-1792.196	Hannan-Quinn criter.		6.418751
Durbin-Watson stat	2.177859			

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 2 (Automatic - based on SIC, maxlag=13)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.877097	0.0000
Test critical values:		
1% level	-2.581120	
5% level	-1.943058	
10% level	-1.615241	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 02/13/12 Time: 16:30

Sample (adjusted): 4 147

Included observations: 144 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.272084	0.055788	-4.877097	0.0000
D(E1(-1))	-0.027212	0.082691	-0.329079	0.7426
D(E1(-2))	0.264576	0.079699	3.319688	0.0011
R-squared	0.203181	Mean dependent var		-0.000610
Adjusted R-squared	0.191878	S.D. dependent var		0.039647
S.E. of regression	0.035640	Akaike info criterion		-3.810056
Sum squared resid	0.179104	Schwarz criterion		-3.748185
Log likelihood	277.3240	Hannan-Quinn criter.		-3.784915
Durbin-Watson stat	2.018219			

1.3 ผลการวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะสั้นด้วยวิธี Threshold Error Correction

Model

1) Upper Regime

Dependent Variable: D(PTT)

Method: Least Squares

Date: 03/10/12 Time: 17:39

Sample (adjusted): 3 404

Included observations: 402 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.134942	0.299762	-0.450163	0.6528
D(PTT(-1))	0.019779	0.037091	0.533249	0.5942
D(BBL)	0.052235	0.002884	18.11345	0.0000
E1(-1)	-0.083181	0.019548	-4.255146	0.0000
R-squared	0.461264	Mean dependent var		-0.116915
Adjusted R-squared	0.457203	S.D. dependent var		8.156741
S.E. of regression	6.009459	Akaike info criterion		6.434447
Sum squared resid	14373.21	Schwarz criterion		6.474213
Log likelihood	-1289.324	Hannan-Quinn criter.		6.450191
F-statistic	113.5888	Durbin-Watson stat		2.105520
Prob(F-statistic)	0.000000			

Dependent Variable: D(LOGPTT)

Method: Least Squares

Date: 03/10/12 Time: 17:52

Sample (adjusted): 3 817

Included observations: 815 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000190	0.000789	-0.240631	0.8099
D(LOGPTT(-1))	0.018671	0.027241	0.685388	0.4933
D(LOGBBL)	0.491691	0.021049	23.35934	0.0000
E1(-1)	-0.023278	0.008392	-2.773728	0.0057
R-squared	0.403008	Mean dependent var		-0.000168
Adjusted R-squared	0.400800	S.D. dependent var		0.029098
S.E. of regression	0.022524	Akaike info criterion		-4.743549
Sum squared resid	0.411456	Schwarz criterion		-4.720466
Log likelihood	1936.996	Hannan-Quinn criter.		-4.734689
F-statistic	182.4927	Durbin-Watson stat		2.160614
Prob(F-statistic)	0.000000			

2) Lower Regime

Dependent Variable: D(PTT)

Method: Least Squares

Date: 03/10/12 Time: 17:37

Sample (adjusted): 3 560

Included observations: 558 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.044928	0.245250	-0.183192	0.8547
D(PTT(-1))	0.027447	0.041995	0.653578	0.5137
D(BBL)	0.029226	0.002988	9.780202	0.0000
E1(-1)	-0.022351	0.009846	-2.270142	0.0236
R-squared	0.148681	Mean dependent var		-0.077061
Adjusted R-squared	0.144071	S.D. dependent var		6.260028
S.E. of regression	5.791555	Akaike info criterion		6.357821
Sum squared resid	18582.33	Schwarz criterion		6.388820
Log likelihood	-1769.832	Hannan-Quinn criter.		6.369927
F-statistic	32.25160	Durbin-Watson stat		2.066593
Prob(F-statistic)	0.000000			

Dependent Variable: D(LOGPTT)

Method: Least Squares

Date: 03/10/12 Time: 18:23

Sample (adjusted): 3 147

Included observations: 145 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002519	0.002909	-0.865920	0.3880
D(LOGPTT(-1))	0.100428	0.075029	1.338529	0.1829
D(LOGBBL)	0.332129	0.068306	4.862393	0.0000
E1(-1)	-0.235722	0.049527	-4.759426	0.0000
R-squared	0.237946	Mean dependent var		-0.004780
Adjusted R-squared	0.221733	S.D. dependent var		0.039045
S.E. of regression	0.034445	Akaike info criterion		-3.871696
Sum squared resid	0.167292	Schwarz criterion		-3.789579
Log likelihood	284.6980	Hannan-Quinn criter.		-3.838329
F-statistic	14.67545	Durbin-Watson stat		2.162515
Prob(F-statistic)	0.000000			

2. หลักทรัพย์ TOP

2.1 การวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะยาวด้วยวิธี Threshold Cointegration

1) Upper Regime

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:01

Sample (adjusted): 3 322

Included observations: 320 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.023199	0.084435	-0.274761	0.7837
E1(-1)	0.971324	0.056115	17.30954	0.0000
E1(-2)	-0.057406	0.056422	-1.017441	0.3097

R-squared	0.835164	Mean dependent var	-0.006487
Adjusted R-squared	0.834124	S.D. dependent var	3.707900
S.E. of regression	1.510150	Akaike info criterion	3.671626
Sum squared resid	722.9357	Schwarz criterion	3.706954
Log likelihood	-584.4602	Hannan-Quinn criter.	3.685733
F-statistic	803.0599	Durbin-Watson stat	1.999363
Prob(F-statistic)	0.000000		

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:31

Sample (adjusted): 3 819

Included observations: 817 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000384	0.001393	-0.275404	0.7831
E1(-1)	0.897054	0.034913	25.69393	0.0000
E1(-2)	0.065650	0.034826	1.885101	0.0598

R-squared	0.925075	Mean dependent var	-0.000644
Adjusted R-squared	0.924891	S.D. dependent var	0.145290
S.E. of regression	0.039818	Akaike info criterion	-3.605324
Sum squared resid	1.290583	Schwarz criterion	-3.588045
Log likelihood	1475.775	Hannan-Quinn criter.	-3.598693
F-statistic	5025.101	Durbin-Watson stat	1.999055
Prob(F-statistic)	0.000000		

2) Lower Regime

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:05

Sample (adjusted): 3 642

Included observations: 640 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000943	0.052150	0.018092	0.9856
E1(-1)	0.888007	0.039342	22.57128	0.0000
E1(-2)	0.094520	0.039305	2.404814	0.0165
R-squared	0.960469	Mean dependent var		-0.056295
Adjusted R-squared	0.960345	S.D. dependent var		6.624858
S.E. of regression	1.319244	Akaike info criterion		3.396672
Sum squared resid	1108.638	Schwarz criterion		3.417585
Log likelihood	-1083.935	Hannan-Quinn criter.		3.404789
F-statistic	7738.505	Durbin-Watson stat		2.007931
Prob(F-statistic)	0.000000			

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:33

Sample (adjusted): 3 145

Included observations: 143 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000717	0.004093	-0.175105	0.8613
E1(-1)	0.856741	0.083914	10.20979	0.0000
E1(-2)	0.013180	0.083809	0.157261	0.8753
R-squared	0.765972	Mean dependent var		-0.002664
Adjusted R-squared	0.762629	S.D. dependent var		0.100426
S.E. of regression	0.048928	Akaike info criterion		-3.176172
Sum squared resid	0.335155	Schwarz criterion		-3.114014
Log likelihood	230.0963	Hannan-Quinn criter.		-3.150914
F-statistic	229.1093	Durbin-Watson stat		1.981562
Prob(F-statistic)	0.000000			

2.2 ผลการทดสอบความนิ่งของค่าความคลาดเคลื่อน (Residual) โดยวิธี ADF

1) Upper Regime

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=16)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.532323	0.0004
Test critical values:		
1% level	-2.572186	
5% level	-1.941814	
10% level	-1.616038	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 02/13/12 Time: 16:01

Sample (adjusted): 2 322

Included observations: 321 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.080797	0.022874	-3.532323	0.0005
R-squared	0.037245	Mean dependent var		-0.026270
Adjusted R-squared	0.037245	S.D. dependent var		1.534565
S.E. of regression	1.505716	Akaike info criterion		3.659525
Sum squared resid	725.4982	Schwarz criterion		3.671274
Log likelihood	-586.3538	Hannan-Quinn criter.		3.664216
Durbin-Watson stat	1.893766			

Null Hypothesis: E1 has a unit root
 Exogenous: None
 Lag Length: 0 (Automatic - based on SIC, maxlag=20)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.267199	0.0000
Test critical values:		
1% level	-2.567792	
5% level	-1.941211	
10% level	-1.616439	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(E1)
 Method: Least Squares
 Date: 02/13/12 Time: 16:31
 Sample (adjusted): 2 819
 Included observations: 818 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.040866	0.009577	-4.267199	0.0000
R-squared	0.021685	Mean dependent var		-0.000441
Adjusted R-squared	0.021685	S.D. dependent var		0.040346
S.E. of regression	0.039906	Akaike info criterion		-3.603333
Sum squared resid	1.301096	Schwarz criterion		-3.597579
Log likelihood	1474.763	Hannan-Quinn criter.		-3.601125
Durbin-Watson stat	2.120107			

2) Lower Regime

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=19)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.665334	0.0076
Test critical values:		
1% level	-2.568575	
5% level	-1.941318	
10% level	-1.616367	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 02/13/12 Time: 16:06

Sample (adjusted): 2 642

Included observations: 641 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.020974	0.007869	-2.665334	0.0079
R-squared	0.010975	Mean dependent var		-0.002220
Adjusted R-squared	0.010975	S.D. dependent var		1.332915
S.E. of regression	1.325580	Akaike info criterion		3.403137
Sum squared resid	1124.585	Schwarz criterion		3.410099
Log likelihood	-1089.705	Hannan-Quinn criter.		3.405839
Durbin-Watson stat	2.176791			

Null Hypothesis: E1 has a unit root
 Exogenous: None
 Lag Length: 0 (Automatic - based on SIC, maxlag=13)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.082548	0.0022
Test critical values:		
1% level	-2.581120	
5% level	-1.943058	
10% level	-1.615241	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(E1)
 Method: Least Squares
 Date: 02/13/12 Time: 16:33
 Sample (adjusted): 2 145
 Included observations: 144 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.123504	0.040066	-3.082548	0.0025
R-squared	0.062306	Mean dependent var		-7.09E-05
Adjusted R-squared	0.062306	S.D. dependent var		0.050385
S.E. of regression	0.048790	Akaike info criterion		-3.195665
Sum squared resid	0.340406	Schwarz criterion		-3.175041
Log likelihood	231.0879	Hannan-Quinn criter.		-3.187285
Durbin-Watson stat	2.023241			

3.3 ผลการวิเคราะห์ความล้มพันธ์เชิงคุณภาพในระยะสั้นด้วยวิธี Threshold Error Correction

Model

1) Upper Regime

Dependent Variable: D(TOP)

Method: Least Squares

Date: 03/10/12 Time: 17:45

Sample (adjusted): 3 322

Included observations: 320 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.015483	0.083963	-0.184407	0.8538
D(TOP(-1))	0.068203	0.054045	1.261948	0.2079
D(BBL)	0.009134	0.001670	5.470334	0.0000
E1(-1)	-0.085563	0.023282	-3.675162	0.0003
R-squared	0.117735	Mean dependent var		0.008687
Adjusted R-squared	0.109359	S.D. dependent var		1.589073
S.E. of regression	1.499669	Akaike info criterion		3.660787
Sum squared resid	710.6863	Schwarz criterion		3.707891
Log likelihood	-581.7259	Hannan-Quinn criter.		3.679597
F-statistic	14.05628	Durbin-Watson stat		2.006812
Prob(F-statistic)	0.000000			

Dependent Variable: D(LOGTOP)

Method: Least Squares

Date: 03/10/12 Time: 18:27

Sample (adjusted): 3 819

Included observations: 817 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000336	0.001117	-0.300581	0.7638
D(LOGTOP(-1))	-0.037372	0.022093	-1.691571	0.0911
D(LOGBBL)	0.894005	0.025391	35.20956	0.0000
E1(-1)	-0.017806	0.007755	-2.296064	0.0219
R-squared	0.604857	Mean dependent var		-0.000282
Adjusted R-squared	0.603399	S.D. dependent var		0.050689
S.E. of regression	0.031922	Akaike info criterion		-4.046167
Sum squared resid	0.828452	Schwarz criterion		-4.023128
Log likelihood	1656.859	Hannan-Quinn criter.		-4.037325
F-statistic	414.8274	Durbin-Watson stat		2.110564
Prob(F-statistic)	0.000000			

2) Lower Regime

Dependent Variable: D(TOP)

Method: Least Squares

Date: 03/10/12 Time: 18:54

Sample (adjusted): 3 642

Included observations: 640 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002830	0.048268	-0.058630	0.9533
D(TOP(-1))	-0.046882	0.038221	-1.226578	0.2204
D(BBL)	0.005120	0.000641	7.992991	0.0000
E1(-1)	-0.005131	0.007490	-0.685107	0.0935
R-squared	0.093019	Mean dependent var		-0.005469
Adjusted R-squared	0.088741	S.D. dependent var		1.279082
S.E. of regression	1.221010	Akaike info criterion		3.243464
Sum squared resid	948.1904	Schwarz criterion		3.271348
Log likelihood	-1033.909	Hannan-Quinn criter.		3.254287
F-statistic	21.74250	Durbin-Watson stat		2.036869
Prob(F-statistic)	0.000000			

Dependent Variable: D(LOGTOP)

Method: Least Squares

Date: 03/10/12 Time: 18:29

Sample (adjusted): 3 145

Included observations: 143 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.001848	0.003591	-0.514556	0.6077
D(LOGTOP(-1))	0.123931	0.068107	1.819646	0.0710
D(LOGBBL)	0.608225	0.068151	8.924663	0.0000
E1(-1)	-0.100658	0.036496	-2.758074	0.0066
R-squared	0.375545	Mean dependent var		-0.004472
Adjusted R-squared	0.362068	S.D. dependent var		0.053479
S.E. of regression	0.042714	Akaike info criterion		-3.440993
Sum squared resid	0.253607	Schwarz criterion		-3.358117
Log likelihood	250.0310	Hannan-Quinn criter.		-3.407316
F-statistic	27.86472	Durbin-Watson stat		2.048620
Prob(F-statistic)	0.000000			

3.หลักทรัพย์ PTTEP

3.1 การวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะยาวด้วยวิธี Threshold Cointegration

1) Upper Regime

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:08

Sample (adjusted): 3 813

Included observations: 811 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001620	0.117393	0.013804	0.9890
E1(-1)	0.801456	0.034461	23.25673	0.0000
E1(-2)	0.164051	0.034464	4.760007	0.0000
R-squared	0.921500	Mean dependent var		0.008643
Adjusted R-squared	0.921306	S.D. dependent var		11.91731
S.E. of regression	3.343102	Akaike info criterion		5.255367
Sum squared resid	9030.474	Schwarz criterion		5.272747
Log likelihood	-2128.052	Hannan-Quinn criter.		5.262040
F-statistic	4742.508	Durbin-Watson stat		2.005696
Prob(F-statistic)	0.000000			

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:35

Sample (adjusted): 3 818

Included observations: 816 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.38E-05	0.000814	0.016910	0.9865
E1(-1)	0.803654	0.034461	23.32085	0.0000
E1(-2)	0.154796	0.034464	4.491474	0.0000
R-squared	0.906596	Mean dependent var		6.30E-05
Adjusted R-squared	0.906367	S.D. dependent var		0.075962
S.E. of regression	0.023244	Akaike info criterion		-4.681868
Sum squared resid	0.439251	Schwarz criterion		-4.664572
Log likelihood	1913.202	Hannan-Quinn criter.		-4.675230
F-statistic	3945.580	Durbin-Watson stat		2.003135
Prob(F-statistic)	0.000000			

2) Lower Regime

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:10

Sample (adjusted): 3 151

Included observations: 149 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.081606	0.357394	-0.228337	0.8197
E1(-1)	0.613450	0.080741	7.597756	0.0000
E1(-2)	0.170023	0.080480	2.112609	0.0363
R-squared	0.578155	Mean dependent var		-0.161081
Adjusted R-squared	0.572376	S.D. dependent var		6.670465
S.E. of regression	4.362013	Akaike info criterion		5.803673
Sum squared resid	2777.965	Schwarz criterion		5.864155
Log likelihood	-429.3737	Hannan-Quinn criter.		5.828246
F-statistic	100.0494	Durbin-Watson stat		1.960327
Prob(F-statistic)	0.000000			

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:38

Sample (adjusted): 3 146

Included observations: 144 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000245	0.003428	-0.071392	0.9432
E1(-1)	0.613392	0.082427	7.441666	0.0000
E1(-2)	0.198064	0.082440	2.402514	0.0176
R-squared	0.603079	Mean dependent var		-0.001034
Adjusted R-squared	0.597449	S.D. dependent var		0.064819
S.E. of regression	0.041126	Akaike info criterion		-3.523746
Sum squared resid	0.238478	Schwarz criterion		-3.461875
Log likelihood	256.7097	Hannan-Quinn criter.		-3.498605
F-statistic	107.1174	Durbin-Watson stat		1.930880
Prob(F-statistic)	0.000000			

3.2 ผลการทดสอบความนิ่งของค่าความคลาดเคลื่อน (Residual) โดยวิธี ADF

1) Upper Regime

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 1 (Automatic - based on SIC, maxlag=20)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.465348	0.0005
Test critical values:		
1% level	-2.567817	
5% level	-1.941214	
10% level	-1.616437	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 02/13/12 Time: 16:08

Sample (adjusted): 3 813

Included observations: 811 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.034493	0.009954	-3.465348	0.0006
D(E1(-1))	-0.164052	0.034443	-4.763006	0.0000
R-squared	0.047473	Mean dependent var		0.002912
Adjusted R-squared	0.046296	S.D. dependent var		3.421167
S.E. of regression	3.341035	Akaike info criterion		5.252902
Sum squared resid	9030.476	Schwarz criterion		5.264488
Log likelihood	-2128.052	Hannan-Quinn criter.		5.257350
Durbin-Watson stat	2.005693			

Null Hypothesis: E1 has a unit root
 Exogenous: None
 Lag Length: 1 (Automatic - based on SIC, maxlag=20)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.830914	0.0001
Test critical values:		
1% level	-2.567799	
5% level	-1.941212	
10% level	-1.616438	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(E1)
 Method: Least Squares
 Date: 02/13/12 Time: 16:36
 Sample (adjusted): 3 818
 Included observations: 816 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.041549	0.010846	-3.830914	0.0001
D(E1(-1))	-0.154797	0.034443	-4.494286	0.0000
R-squared	0.048327	Mean dependent var		2.01E-05
Adjusted R-squared	0.047158	S.D. dependent var		0.023798
S.E. of regression	0.023230	Akaike info criterion		-4.684318
Sum squared resid	0.439252	Schwarz criterion		-4.672788
Log likelihood	1913.202	Hannan-Quinn criter.		-4.679893
Durbin-Watson stat	2.003132			

2) Lower Regime

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=13)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.624786	0.0000
Test critical values:		
1% level	-2.580470	
5% level	-1.942967	
10% level	-1.615298	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 02/13/12 Time: 16:10

Sample (adjusted): 2 151

Included observations: 150 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.247361	0.053486	-4.624786	0.0000
R-squared	0.125511	Mean dependent var		-0.021196
Adjusted R-squared	0.125511	S.D. dependent var		4.734163
S.E. of regression	4.427110	Akaike info criterion		5.820016
Sum squared resid	2920.297	Schwarz criterion		5.840087
Log likelihood	-435.5012	Hannan-Quinn criter.		5.828170
Durbin-Watson stat	2.258744			

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 1 (Automatic - based on SIC, maxlag=13)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.354247	0.0009
Test critical values:		
1% level	-2.581120	
5% level	-1.943058	
10% level	-1.615241	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 02/13/12 Time: 16:38

Sample (adjusted): 3 146

Included observations: 144 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.188479	0.056191	-3.354247	0.0010
D(E1(-1))	-0.198098	0.082150	-2.411424	0.0172
R-squared	0.152749	Mean dependent var		-6.39E-05
Adjusted R-squared	0.146782	S.D. dependent var		0.044367
S.E. of regression	0.040982	Akaike info criterion		-3.537599
Sum squared resid	0.238487	Schwarz criterion		-3.496351
Log likelihood	256.7071	Hannan-Quinn criter.		-3.520838
Durbin-Watson stat	1.930860			

3.3 ผลการวิเคราะห์ความล้มพันธ์เชิงดุลยภาพในระยะสั้นด้วยวิธี Threshold Error Correction

Model

1) Upper Regime

Dependent Variable: D(PTTEP)

Method: Least Squares

Date: 03/10/12 Time: 18:58

Sample (adjusted): 3 813

Included observations: 811 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004325	0.113009	0.038267	0.9695
D(PTTEP(-1))	-0.026230	0.025094	-1.045243	0.2962
D(BBL)	0.025334	0.000901	28.10494	0.0000
E1(-1)	-0.034156	0.009547	-3.577740	0.0004
R-squared	0.495548	Mean dependent var		0.007398
Adjusted R-squared	0.493673	S.D. dependent var		4.522793
S.E. of regression	3.218270	Akaike info criterion		5.180485
Sum squared resid	8358.309	Schwarz criterion		5.203658
Log likelihood	-2096.687	Hannan-Quinn criter.		5.189381
F-statistic	264.2517	Durbin-Watson stat		2.192446
Prob(F-statistic)	0.000000			

Dependent Variable: D(LOGPTTEP)

Method: Least Squares

Date: 03/10/12 Time: 18:31

Sample (adjusted): 3 818

Included observations: 816 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.85E-05	0.000792	0.035949	0.9713
D(LOGPTTEP(-1))	-0.052781	0.024848	-2.124135	0.0340
D(LOGBBL)	0.487418	0.016966	28.72926	0.0000
E1(-1)	-0.040220	0.010531	-3.819237	0.0001
R-squared	0.505206	Mean dependent var		4.60E-05
Adjusted R-squared	0.503378	S.D. dependent var		0.032121
S.E. of regression	0.022636	Akaike info criterion		-4.733649
Sum squared resid	0.416064	Schwarz criterion		-4.710588
Log likelihood	1935.329	Hannan-Quinn criter.		-4.724799
F-statistic	276.3625	Durbin-Watson stat		2.156512
Prob(F-statistic)	0.000000			

2) Lower Regime

Dependent Variable: D(PTTEP)

Method: Least Squares

Date: 03/10/12 Time: 19:00

Sample (adjusted): 3 151

Included observations: 149 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.320228	0.346215	-0.924942	0.3565
D(PTTEP(-1))	0.018087	0.063519	0.284748	0.7762
D(BBL)	0.011521	0.003249	3.545827	0.0005
E1(-1)	-0.225470	0.054443	-4.141371	0.0001
R-squared	0.155880	Mean dependent var		-0.496644
Adjusted R-squared	0.138415	S.D. dependent var		4.493895
S.E. of regression	4.171305	Akaike info criterion		5.720814
Sum squared resid	2522.969	Schwarz criterion		5.801457
Log likelihood	-422.2006	Hannan-Quinn criter.		5.753578
F-statistic	8.925482	Durbin-Watson stat		2.056070
Prob(F-statistic)	0.000018			

Dependent Variable: D(LOGPTTEP)

Method: Least Squares

Date: 03/10/12 Time: 18:36

Sample (adjusted): 3 146

Included observations: 144 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000975	0.003419	-0.285024	0.7760
D(LOGPTTEP(-1))	-0.021818	0.076260	-0.286101	0.7752
D(LOGBBL)	0.397588	0.062685	6.342664	0.0000
E1(-1)	-0.205799	0.055937	-3.679103	0.0003
R-squared	0.259629	Mean dependent var		-0.002207
Adjusted R-squared	0.243764	S.D. dependent var		0.047043
S.E. of regression	0.040909	Akaike info criterion		-3.527530
Sum squared resid	0.234301	Schwarz criterion		-3.445035
Log likelihood	257.9822	Hannan-Quinn criter.		-3.494009
F-statistic	16.36481	Durbin-Watson stat		2.129077
Prob(F-statistic)	0.000000			

4. หลักทรัพย์ PTTAR

4.1 การวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะยาวด้วยวิธี Threshold Cointegration

1) Upper Regime

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:14

Sample (adjusted): 3 818

Included observations: 816 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.019348	0.038014	-0.508961	0.6109
E1(-1)	0.953961	0.035069	27.20207	0.0000
E1(-2)	0.011319	0.034956	0.323791	0.7462
R-squared	0.936853	Mean dependent var		-0.026595
Adjusted R-squared	0.936698	S.D. dependent var		4.315298
S.E. of regression	1.085726	Akaike info criterion		3.006045
Sum squared resid	958.3656	Schwarz criterion		3.023341
Log likelihood	-1223.466	Hannan-Quinn criter.		3.012683
F-statistic	6030.872	Durbin-Watson stat		1.999069
Prob(F-statistic)	0.000000			

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:40

Sample (adjusted): 3 820

Included observations: 818 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000336	0.001523	-0.220414	0.8256
E1(-1)	0.963824	0.013645	70.63393	0.0000
E1(-2)	0.000458	0.010974	0.041738	0.9667
R-squared	0.931692	Mean dependent var		0.003977
Adjusted R-squared	0.931525	S.D. dependent var		0.166365
S.E. of regression	0.043534	Akaike info criterion		-3.426889
Sum squared resid	1.544595	Schwarz criterion		-3.409626
Log likelihood	1404.597	Hannan-Quinn criter.		-3.420264
F-statistic	5558.162	Durbin-Watson stat		2.050077
Prob(F-statistic)	0.000000			

2) Lower Regime

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:18

Sample (adjusted): 3 146

Included observations: 144 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.042686	0.067621	-0.631257	0.5289
E1(-1)	0.942860	0.036971	25.50262	0.0000
E1(-2)	-0.019011	0.032469	-0.585497	0.5591
R-squared	0.900738	Mean dependent var		0.070948
Adjusted R-squared	0.899330	S.D. dependent var		2.552174
S.E. of regression	0.809769	Akaike info criterion		2.436478
Sum squared resid	92.45739	Schwarz criterion		2.498349
Log likelihood	-172.4264	Hannan-Quinn criter.		2.461619
F-statistic	639.7385	Durbin-Watson stat		2.059862
Prob(F-statistic)	0.000000			

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 17:06

Sample (adjusted): 3 144

Included observations: 142 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.001652	0.004077	-0.405155	0.6860
E1(-1)	0.824991	0.084296	9.786863	0.0000
E1(-2)	0.077491	0.083511	0.927909	0.3551
R-squared	0.825225	Mean dependent var		-0.002919
Adjusted R-squared	0.822710	S.D. dependent var		0.115350
S.E. of regression	0.048569	Akaike info criterion		-3.190761
Sum squared resid	0.327894	Schwarz criterion		-3.128314
Log likelihood	229.5440	Hannan-Quinn criter.		-3.165385
F-statistic	328.1540	Durbin-Watson stat		1.951856
Prob(F-statistic)	0.000000			

4.2 ผลการทดสอบความนิ่งของค่าความคลาดเคลื่อน (Residual) โดยวิธี ADF

1) Upper Regime

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 0 (Automatic – based on SIC, maxlag=20)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.003095	0.0001
Test critical values:		
1% level	-2.567796	
5% level	-1.941211	
10% level	-1.616439	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 02/13/12 Time: 16:14

Sample (adjusted): 2 818

Included observations: 817 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.034977	0.008737	-4.003095	0.0001
R-squared	0.018958	Mean dependent var		-0.019206
Adjusted R-squared	0.018958	S.D. dependent var		1.094394
S.E. of regression	1.083971	Akaike info criterion		3.000363
Sum squared resid	958.7950	Schwarz criterion		3.006123
Log likelihood	-1224.648	Hannan-Quinn criter.		3.002574
Durbin-Watson stat	2.021469			

Null Hypothesis: E1 has a unit root
 Exogenous: None
 Lag Length: 0 (Automatic – based on SIC, maxlag=20)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-21.36191	0.0000
Test critical values:		
1% level	-2.567789	
5% level	-1.941210	
10% level	-1.616439	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(E1)
 Method: Least Squares
 Date: 02/13/12 Time: 16:40
 Sample (adjusted): 2 820
 Included observations: 819 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.402847	0.018858	-21.36191	0.0000
R-squared	0.357532	Mean dependent var		0.004122
Adjusted R-squared	0.357532	S.D. dependent var		0.139292
S.E. of regression	0.111648	Akaike info criterion		-1.545711
Sum squared resid	10.19660	Schwarz criterion		-1.539962
Log likelihood	633.9685	Hannan-Quinn criter.		-1.543505
Durbin-Watson stat	0.718232			

2) Lower Regime

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 0 (Automatic – based on SIC, maxlag=13)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.268451	0.0000
Test critical values:		
1% level	-2.581008	
5% level	-1.943042	
10% level	-1.615251	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 02/13/12 Time: 16:19

Sample (adjusted): 2 146

Included observations: 145 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.373901	0.051442	-7.268451	0.0000
R-squared	0.266309	Mean dependent var		0.113935
Adjusted R-squared	0.266309	S.D. dependent var		2.135481
S.E. of regression	1.829163	Akaike info criterion		4.052467
Sum squared resid	481.8006	Schwarz criterion		4.072996
Log likelihood	-292.8038	Hannan-Quinn criter.		4.060809
Durbin-Watson stat	0.745628			

Null Hypothesis: E1 has a unit root
 Exogenous: None
 Lag Length: 0 (Automatic – based on SIC, maxlag=13)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.868429	0.0043
Test critical values:		
1% level	-2.581233	
5% level	-1.943074	
10% level	-1.615231	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(E1)
 Method: Least Squares
 Date: 02/13/12 Time: 17:06
 Sample (adjusted): 2 144
 Included observations: 143 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.099053	0.034532	-2.868429	0.0048
R-squared	0.054193	Mean dependent var		-0.001224
Adjusted R-squared	0.054193	S.D. dependent var		0.049751
S.E. of regression	0.048385	Akaike info criterion		-3.212306
Sum squared resid	0.332431	Schwarz criterion		-3.191587
Log likelihood	230.6799	Hannan-Quinn criter.		-3.203887
Durbin-Watson stat	2.142989			

4.3 ผลการวิเคราะห์ความล้มพันธ์เชิงดุลยภาพในระยะสั้นด้วยวิธี Threshold Error Correction

Model

1) Upper Regime

Dependent Variable: D(PTTAR)

Method: Least Squares

Date: 03/10/12 Time: 19:02

Sample (adjusted): 3 818

Included observations: 816 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.015850	0.026607	-0.595720	0.5515
D(PTTAR(-1))	0.081959	0.031521	2.600102	0.0095
D(BBL)	0.005183	0.000361	14.33759	0.0000
E1(-1)	-0.006732	0.006264	-1.074693	0.0828
R-squared	0.220566	Mean dependent var		-0.016238
Adjusted R-squared	0.217687	S.D. dependent var		0.859160
S.E. of regression	0.759914	Akaike info criterion		2.293667
Sum squared resid	468.9051	Schwarz criterion		2.316728
Log likelihood	-931.8162	Hannan-Quinn criter.		2.302518
F-statistic	76.59408	Durbin-Watson stat		2.098526
Prob(F-statistic)	0.000000			

Dependent Variable: D(LOGPTTAR)

Method: Least Squares

Date: 03/10/12 Time: 18:40

Sample (adjusted): 3 820

Included observations: 818 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000439	0.001081	-0.406530	0.6845
D(LOGPTTAR(-1))	-0.000467	0.007799	-0.059919	0.9522
D(LOGBBL)	0.543266	0.038232	14.20968	0.0000
E1(-1)	-0.002410	0.006623	-0.363923	0.0439
R-squared	0.202621	Mean dependent var		-0.000430
Adjusted R-squared	0.199682	S.D. dependent var		0.034531
S.E. of regression	0.030891	Akaike info criterion		-4.111812
Sum squared resid	0.776774	Schwarz criterion		-4.088795
Log likelihood	1685.731	Hannan-Quinn criter.		-4.102979
F-statistic	68.94816	Durbin-Watson stat		1.975212
Prob(F-statistic)	0.000000			

2) Lower Regime

Dependent Variable: D(PTTAR)

Method: Least Squares

Date: 03/10/12 Time: 19:04

Sample (adjusted): 3 146

Included observations: 144 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.104082	0.057540	-1.808854	0.0726
D(PTTAR(-1))	0.024894	0.022759	1.093834	0.2759
D(BBL)	0.001710	0.000523	3.268681	0.0014
E1(-1)	-0.060600	0.022479	-2.695916	0.0079
R-squared	0.108477	Mean dependent var		-0.135417
Adjusted R-squared	0.089373	S.D. dependent var		0.715363
S.E. of regression	0.682648	Akaike info criterion		2.101708
Sum squared resid	65.24107	Schwarz criterion		2.184203
Log likelihood	-147.3230	Hannan-Quinn criter.		2.135230
F-statistic	5.678237	Durbin-Watson stat		1.905654
Prob(F-statistic)	0.001065			

Dependent Variable: D(LOGPTTAR)

Method: Least Squares

Date: 03/10/12 Time: 18:44

Sample (adjusted): 3 144

Included observations: 142 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.003805	0.003516	-1.082160	0.2811
D(LOGPTTAR(-1))	0.139662	0.074688	1.869940	0.0636
D(LOGBBL)	0.467108	0.081476	5.733103	0.0000
E1(-1)	-0.088384	0.029771	-2.968783	0.0035
R-squared	0.247626	Mean dependent var		-0.007251
Adjusted R-squared	0.231270	S.D. dependent var		0.046912
S.E. of regression	0.041132	Akaike info criterion		-3.516319
Sum squared resid	0.233469	Schwarz criterion		-3.433056
Log likelihood	253.6587	Hannan-Quinn criter.		-3.482485
F-statistic	15.13980	Durbin-Watson stat		2.031305
Prob(F-statistic)	0.000000			

5. หลักทรัพย์ IRPC

5.1 การวิเคราะห์ความสัมพันธ์เชิงดุลยภาพในระยะยาวด้วยวิธี Threshold Cointegration

1) Upper Regime

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:20

Sample (adjusted): 3 500

Included observations: 498 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002507	0.005926	-0.423026	0.6725
E1(-1)	0.875293	0.044636	19.60959	0.0000
E1(-2)	0.050753	0.044359	1.144140	0.2531
R-squared	0.851758	Mean dependent var		-0.003172
Adjusted R-squared	0.851159	S.D. dependent var		0.342670
S.E. of regression	0.132202	Akaike info criterion		-1.202968
Sum squared resid	8.651277	Schwarz criterion		-1.177603
Log likelihood	302.5390	Hannan-Quinn criter.		-1.193013
F-statistic	1422.062	Durbin-Watson stat		1.993958
Prob(F-statistic)	0.000000			

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 17:08

Sample (adjusted): 3 634

Included observations: 632 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000371	0.001103	-0.336597	0.7365
E1(-1)	0.925858	0.039754	23.28940	0.0000
E1(-2)	0.001136	0.039626	0.028667	0.9771
R-squared	0.857822	Mean dependent var		-0.000449
Adjusted R-squared	0.857370	S.D. dependent var		0.073430
S.E. of regression	0.027732	Akaike info criterion		-4.327726
Sum squared resid	0.483740	Schwarz criterion		-4.306608
Log likelihood	1370.561	Hannan-Quinn criter.		-4.319524
F-statistic	1897.518	Durbin-Watson stat		1.995024
Prob(F-statistic)	0.000000			

2) Lower Regime

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 16:22

Sample (adjusted): 3 464

Included observations: 462 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000706	0.005156	-0.136917	0.8912
E1(-1)	0.913842	0.046402	19.69415	0.0000
E1(-2)	0.068973	0.046268	1.490720	0.1367
R-squared	0.966753	Mean dependent var		-0.004830
Adjusted R-squared	0.966608	S.D. dependent var		0.606472
S.E. of regression	0.110823	Akaike info criterion		-1.555287
Sum squared resid	5.637348	Schwarz criterion		-1.528433
Log likelihood	362.2713	Hannan-Quinn criter.		-1.544714
F-statistic	6673.386	Durbin-Watson stat		2.000001
Prob(F-statistic)	0.000000			

Dependent Variable: E1

Method: Least Squares

Date: 02/13/12 Time: 17:11

Sample (adjusted): 3 330

Included observations: 328 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000118	0.002344	-0.050508	0.9597
E1(-1)	0.812808	0.054833	14.82338	0.0000
E1(-2)	0.146610	0.054708	2.679842	0.0077
R-squared	0.910549	Mean dependent var		-0.001474
Adjusted R-squared	0.909999	S.D. dependent var		0.141492
S.E. of regression	0.042448	Akaike info criterion		-3.471977
Sum squared resid	0.585591	Schwarz criterion		-3.437285
Log likelihood	572.4043	Hannan-Quinn criter.		-3.458136
F-statistic	1654.142	Durbin-Watson stat		2.007383
Prob(F-statistic)	0.000000			

5.2 ผลการทดสอบความนิ่งของค่าความคลาดเคลื่อน (Residual) โดยวิธี ADF

1) Upper Regime

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=17)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.824308	0.0000
Test critical values:		
1% level	-2.569604	
5% level	-1.941459	
10% level	-1.616273	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 02/13/12 Time: 16:20

Sample (adjusted): 2 500

Included observations: 499 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.083144	0.017234	-4.824308	0.0000
R-squared	0.044149	Mean dependent var		-0.003101
Adjusted R-squared	0.044149	S.D. dependent var		0.135846
S.E. of regression	0.132814	Akaike info criterion		-1.197738
Sum squared resid	8.784451	Schwarz criterion		-1.189296
Log likelihood	299.8356	Hannan-Quinn criter.		-1.194425
Durbin-Watson stat	2.069395			

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=19)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.094537	0.0000
Test critical values:		
1% level	-2.568620	
5% level	-1.941324	
10% level	-1.616363	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 02/13/12 Time: 17:08

Sample (adjusted): 2 634

Included observations: 633 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.076431	0.015003	-5.094537	0.0000
R-squared	0.039165	Mean dependent var		-0.000486
Adjusted R-squared	0.039165	S.D. dependent var		0.028344
S.E. of regression	0.027783	Akaike info criterion		-4.327184
Sum squared resid	0.487848	Schwarz criterion		-4.320154
Log likelihood	1370.554	Hannan-Quinn criter.		-4.324454
Durbin-Watson stat	1.984626			

2) Lower Regime

Null Hypothesis: E1 has a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=17)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.310394	0.0203
Test critical values:		
1% level	-2.569966	
5% level	-1.941509	
10% level	-1.616240	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(E1)

Method: Least Squares

Date: 02/13/12 Time: 16:22

Sample (adjusted): 2 464

Included observations: 463 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.019604	0.008485	-2.310394	0.0213
R-squared	0.011336	Mean dependent var		-0.001044
Adjusted R-squared	0.011336	S.D. dependent var		0.111766
S.E. of regression	0.111131	Akaike info criterion		-1.554060
Sum squared resid	5.705728	Schwarz criterion		-1.545123
Log likelihood	360.7648	Hannan-Quinn criter.		-1.550542
Durbin-Watson stat	2.125718			

Null Hypothesis: E1 has a unit root
 Exogenous: None
 Lag Length: 1 (Automatic - based on SIC, maxlag=16)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.424201	0.0151
Test critical values:		
1% level	-2.572031	
5% level	-1.941793	
10% level	-1.616052	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(E1)
 Method: Least Squares
 Date: 02/13/12 Time: 17:11
 Sample (adjusted): 3 330
 Included observations: 328 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E1(-1)	-0.040574	0.016737	-2.424201	0.0159
D(E1(-1))	-0.146601	0.054624	-2.683810	0.0077
R-squared	0.044835	Mean dependent var		-3.13E-05
Adjusted R-squared	0.041905	S.D. dependent var		0.043300
S.E. of regression	0.042383	Akaike info criterion		-3.478067
Sum squared resid	0.585596	Schwarz criterion		-3.454939
Log likelihood	572.4030	Hannan-Quinn criter.		-3.468839
Durbin-Watson stat	2.007400			

5.3 ผลการวิเคราะห์ความล้มพันธ์เชิงดุลยภาพในระยะสั้นด้วยวิธี Threshold Error Correction

Model

1) Upper Regime

Dependent Variable: D(IRPC)

Method: Least Squares

Date: 03/10/12 Time: 19:06

Sample (adjusted): 3 500

Included observations: 498 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002331	0.005302	-0.439587	0.6604
D(IRPC(-1))	0.007328	0.035962	0.203764	0.8386
D(BBL)	0.000919	5.50E-05	16.70684	0.0000
E1(-1)	-0.059846	0.015633	-3.828284	0.0001
R-squared	0.364736	Mean dependent var		-0.002309
Adjusted R-squared	0.360878	S.D. dependent var		0.147974
S.E. of regression	0.118298	Akaike info criterion		-1.423223
Sum squared resid	6.913223	Schwarz criterion		-1.389403
Log likelihood	358.3825	Hannan-Quinn criter.		-1.409950
F-statistic	94.54324	Durbin-Watson stat		2.030227
Prob(F-statistic)	0.000000			

Dependent Variable: D(LOGIRPC)

Method: Least Squares

Date: 03/10/12 Time: 18:47

Sample (adjusted): 3 634

Included observations: 632 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000356	0.001047	-0.339709	0.7342
D(LOGIRPC(-1))	0.032916	0.022789	1.444411	0.1491
D(LOGBBL)	0.821277	0.022700	36.17889	0.0000
E1(-1)	-0.064442	0.014376	-4.482723	0.0000
R-squared	0.676042	Mean dependent var		-0.000353
Adjusted R-squared	0.674494	S.D. dependent var		0.046113
S.E. of regression	0.026309	Akaike info criterion		-4.431520
Sum squared resid	0.434671	Schwarz criterion		-4.403362
Log likelihood	1404.360	Hannan-Quinn criter.		-4.420584
F-statistic	436.8405	Durbin-Watson stat		2.004692
Prob(F-statistic)	0.000000			

2) Lower Regime

Dependent Variable: D(IRPC)

Method: Least Squares

Date: 03/10/12 Time: 19:08

Sample (adjusted): 3 464

Included observations: 462 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.001289	0.004742	-0.271905	0.7858
D(IRPC(-1))	-0.007735	0.044847	-0.172486	0.8631
D(BBL)	0.000364	5.49E-05	6.631623	0.0000
E1(-1)	-0.009955	0.007904	-1.259390	0.0285
R-squared	0.088215	Mean dependent var		-0.001710
Adjusted R-squared	0.082242	S.D. dependent var		0.106359
S.E. of regression	0.101892	Akaike info criterion		-1.721193
Sum squared resid	4.754913	Schwarz criterion		-1.685388
Log likelihood	401.5957	Hannan-Quinn criter.		-1.707096
F-statistic	14.77043	Durbin-Watson stat		2.026264
Prob(F-statistic)	0.000000			

Dependent Variable: D(LOGIRPC)

Method: Least Squares

Date: 03/10/12 Time: 18:49

Sample (adjusted): 3 330

Included observations: 328 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000370	0.002026	-0.182852	0.8550
D(LOGIRPC(-1))	-0.016829	0.054030	-0.311471	0.7556
D(LOGBBL)	0.268968	0.051286	5.244455	0.0000
E1(-1)	-0.024405	0.014611	-1.670334	0.0958
R-squared	0.080972	Mean dependent var		-0.000468
Adjusted R-squared	0.072462	S.D. dependent var		0.038089
S.E. of regression	0.036684	Akaike info criterion		-3.760858
Sum squared resid	0.436001	Schwarz criterion		-3.714602
Log likelihood	620.7807	Hannan-Quinn criter.		-3.742403
F-statistic	9.515457	Durbin-Watson stat		2.044378
Prob(F-statistic)	0.000005			

ประวัติผู้เขียน

ชื่อ-สกุล

นางสาวภรณ์ศิริ ไชยลิขิต

วัน เดือน ปี เกิด

6 กรกฎาคม 2531

ประวัติการศึกษา

สำเร็จการศึกษามัธยมศึกษาตอนปลาย

โรงเรียนเบญจมราชูทิศ นครศรีธรรมราช ปีการศึกษา 2549

สำเร็จการศึกษาระดับปริญญาตรี เศรษฐศาสตรบัณฑิต

คณะเศรษฐศาสตร์ มหาวิทยาลัยเชียงใหม่ ปีการศึกษา 2553

(เกียรตินิยมอันดับ 1)