Lampiran 1 : Data*Price* Komoditas Energi

No	Tanggal	Cushing, OK WTI Spot Price FOB (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Spot Price FOB (Cents per Gallon)	Mont Belvieu, TX Propane Spot Price FOB (Cents per Gallon)	Cushing, OK Crude Oil Future Contract 1 (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Future Contract 1 (Cents per Gallon)	Mont Belvieu, Tx Propane Future Contract 1 (Cents per Gallon)
1	Dec 31, 1986	17.93	48.15		17.94	48.9	
2	Jan 02, 1987	18.13	49		18.13	50.71	
3	Jan 05, 1987	17.98	48.38		17.95	49.96	
4	Jan 06, 1987	18.21	49.38		18.22	50.96	
5	Jan 07, 1987	18.28	49.88		18.25	51.21	
6	Jan 08, 1987	18.63	50.63		18.57	51.99	
7	Jan 09, 1987	18.78	51.88		18.77	53.01	
8	Jan 12, 1987	19	53.53		19.01	54.66	
9	Jan 13, 1987	18.86	53.38		18.89	54.22	
10	Jan 14, 1987	19.13	54.98		19.13	55.4	
11	Jan 15, 1987	19.09	55.13		19.14	55.42	
12	Jan 16, 1987	19.13	55.05		19.1	55.3	
13	Jan 19, 1987	18.7	53.08		18.7	53.15	
14	Jan 20, 1987	18.73	53.95		18.72	53.81	
15	Jan 21, 1987	18.6	52.23		18.69	52.6	
16	Jan 22, 1987	18.76	53.75		18.87	53.97	
17	Jan 23, 1987	18.59	53.08		18.76	53.39	
18	Jan 26, 1987	18.63	52.05		18.64	52.22	
19	Jan 27, 1987	18.48	51.6		18.47	51.67	
20	Jan 28, 1987	18.56	50.68		18.58	51.07	
21	Jan 29, 1987	18.68	51.05		18.66	51.49	
22	Jan 30, 1987	18.73	52.08		18.75	52.22	
23	Feb 02, 1987	18.59	50.7		18.54	51.15	
24	Feb 03, 1987	18.38	50.13		18.36	50.23	
25	Feb 04, 1987	18.26	49.13		18.26	49.5	
26	Feb 05, 1987	18.56	50.58		18.58	51.02	
27	Feb 06, 1987	18.44	49.78		18.44	50.23	
28	Feb 09, 1987	18.37	48.83		18.34	49.23	
29	Feb 10, 1987	18.43	48.98		18.45	49.59	
30	Feb 11, 1987	18.03	47.53		18.06	47.88	
31	Feb 12, 1987	18.05	47.93		17.98	48.34	
32	Feb 13, 1987	17.83	47.48		17.85	47.88	
33	Feb 17, 1987	17.78	47.73		17.79	47.9	
34	Feb 18, 1987	17.44	46.78		17.4	47.19	
35	Feb 19, 1987	17.48	46.15		17.44	46.78	
36	Feb 20, 1987	17.83	47.18		17.77	47.66	
37	Feb 23, 1987	17.15	45.4		17.08	45.83	
38	Feb 24, 1987	16.75	44.48		16.73	45.01	
39	Feb 25, 1987	16.43	43.25		16.4	43.9	
40	Feb 26, 1987	16.98	44.88		16.78	44.75	
41	Feb 27, 1987	16.45	43		16.6	43.41	
42	Mar 02, 1987	16.43	42.73		16.39	43.3	
43	Mar 03, 1987	17.4	45.88		17.35	46.28	
44	Mar 04, 1987	17.4	45.83		17.51	46.44	
45	Mar 05, 1987	18	48.38		17.75	47.91	
46	Mar 06, 1987	18.13	49.38		18.13	49.19	
47	Mar 09, 1987	18.13	49.13		18.04	48.98	
48	Mar 10, 1987	18.27	50.13		18.12	49.26	
49	Mar 11, 1987	18.33	50.15		18.35	50.24	
50	Mar 12, 1987	18.42	50.33		18.39	50.4	
51	Mar 13, 1987	18.39	50.63		18.36	50.41	
52	Mar 16, 1987	18.61	52.03		18.64	51.65	
53	Mar 17, 1987	18.94	52.95		18.87	52.11	
54	Mar 18, 1987	18.75	49.93		18.69	50.35	
55	Mar 19, 1987	18.61	50.98		18.6	50.59	
56	Mar 20, 1987	18.7	49.98		18.67	49.77	
57	Mar 23, 1987	18.6	49.53		18.27	49.31	
58	Mar 24, 1987		49.93		18.71	50.5	
59	Mar 25, 1987	18.48	49.15		18.47	49.37	
60	Mar 26, 1987	18.63	48.88		18.63	49.25	
61	Mar 27, 1987	18.65	48.88		18.62	49.12	
62	Mar 30, 1987	18.67	48.78		18.69	49.15	
63	Mar 31, 1987	18.82	47.13		18.83	49.7	
64	Apr 01, 1987	18.78	49.53		18.78	49.42	
65	Apr 02, 1987	18.9	49.88		18.91	49.74	
66	Apr 03, 1987	18.68	49.35		18.7	49.35	
67	Apr 06, 1987	18.71	48.88		18.67	48.79	
68	Apr 07, 1987	18.69	48.78		18.84	49.24	
69	Apr 08, 1987	18.68	48.28		18.65	48.15	
70	Apr 09, 1987	18.64	47.83		18.59	47.72	
71	Apr 10, 1987	18.26	46.88		18.11	46.78	
72	Apr 13, 1987	18.07	47.28		18.01	47.03	
73	Apr 14, 1987	18.09	46.95		17.98	46.67	
74	Apr 15, 1987	18.46	48.05		18.47	47.94	
75	Apr 16, 1987	18.58	47.63		18.64	47.49	
76	Apr 20, 1987	18.66	46.98		18.65	46.83	
77	Apr 21, 1987	18.97	47.58		19.03	47.71	
78	Apr 22, 1987	19.03	47.88		18.39	47.74	
79	Apr 23, 1987	19.03	49.43		18.59	49.32	
80	Apr 24, 1987	19.01	49.73		18.68	49.6	
81	Apr 27, 1987	18.83	49.88		18.83	49.73	
82	Apr 28, 1987	18.73	49.55		18.84	49.85	
83	Apr 29, 1987	18.66	48.43		18.6	48.56	
84	Apr 30, 1987	18.76	49.38		18.73	49.52	
85	May 01, 1987	18.84	49.38		18.83	49.24	
86	May 04, 1987	18.93	49.63		18.92	49.49	
87	May 05, 1987	19.18	50.25		19.05	49.77	
88	May 06, 1987	19.22	51.33		19.23	51.2	
89	May 07, 1987	19.08	50.78		19.13	50.77	
90	May 08, 1987	19.28	51.53		19.26	51.39	
91	May 11, 1987	19.43	51.73		19.41	52.06	
92	May 12, 1987	19.37	52.33		19.27	51.66	
93	May 13, 1987	19.39	52.05		19.41	51.83	
94	May 14, 1987	19.56	52.43		19.56	52.05	
95	May 15, 1987	19.84	52.38		19.8	51.89	
96	May 18, 1987	19.91	52.38		19.89	51.92	
97	May 19, 1987	19.97	52.63		19.87	52.03	
98	May 20, 1987	19.75	52.23		19.03	51.62	
99	May 21, 1987	19.95	53.1		19.24	52.38	
100	May 22, 1987	19.68	52.73		19.35	52.08	
101	May 25, 1987						
102	May 26, 1987	19.35	52.68		19.42	52	
103	May 27, 1987	19.38	52.03		19.37	51.65	
104	May 28, 1987	19.28	51.68		19.26	51.32	
105	May 29, 1987	19.36	51.88		19.38	51.45	
106	Jun 01, 1987	19.55	51.88		19.56	50.99	

No	Tanggal	Cushing, OK WTI Spot Price FOB (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Spot Price FOB (Cents per Gallon)	Mont Belvieu, TX Propane Spot Price FOB (Cents per Gallon)	Cushing, OK Crude Oil Future Contract 1 (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Future Contract 1 (Cents per Gallon)	Mont Belvieu, Tx Propane Future Contract 1 (Cents per Gallon)
107	Jun 02, 1987	19.7	51.4		19.69	51.38	
108	Jun 03, 1987	19.87	51.93		19.86	51.55	
109	Jun 04, 1987	19.75	51.63		19.81	51.42	
110	Jun 05, 1987	19.79	51.5		19.79	51.37	
111	Jun 08, 1987	19.94	52.23		19.9	52	
112	Jun 09, 1987	19.84	52.28		19.82	51.88	
113	Jun 10, 1987	19.83	52.43		19.82	52.15	
114	Jun 11, 1987	19.85	52.33		19.85	51.93	
115	Jun 12, 1987	19.93	52.23		19.91	51.85	
116	Jun 15, 1987	20.07	52.63		20.06	52.38	
117	Jun 16, 1987	20.27	52.88		20.27	52.55	
118	Jun 17, 1987	20.41	53.15		20.39	52.68	
119	Jun 18, 1987	20.5	52.88		20.52	52.54	
120	Jun 19, 1987	20.65	52.88		20.66	52.52	
121	Jun 22, 1987	20.49	51.25		20.48	51.16	
122	Jun 23, 1987	19.95	51.38		19.57	51.21	
123	Jun 24, 1987	20.13	51.23		19.4	50.86	
124	Jun 25, 1987	20.15	51.53		19.64	51.16	
125	Jun 26, 1987	20.34	52.98		20.24	52.59	
126	Jun 29, 1987	20.38	53.43		20.35	53.37	
127	Jun 30, 1987	20.22	53.9		20.29	53.79	
128	Jul 01, 1987	20.47	54.03		20.48	53.91	
129	Jul 02, 1987	20.61	54.13		20.61	53.79	
130	Jul 03, 1987	20.61					
131	Jul 06, 1987	20.92	54.43		20.93	54.27	
132	Jul 07, 1987	20.76	53.48		20.74	53.84	
133	Jul 08, 1987	20.94	53.88		20.88	54.13	
134	Jul 09, 1987	21.32	54.73		21.23	54.97	
135	Jul 10, 1987	21.34	55.05		21.33	55.32	
136	Jul 13, 1987	21.38	54.78		21.4	55.02	
137	Jul 14, 1987	21.65	55.4		21.58	55.38	
138	Jul 15, 1987	22.23	55.53		22.15	55.93	
139	Jul 16, 1987	22.44	55.93		22.34	55.9	
140	Jul 17, 1987	22.44	56.28		22.39	56.67	
141	Jul 20, 1987	22.23	56.38		22.2	56.75	
142	Jul 21, 1987	21.75	55.18		21.7	55.42	
143	Jul 22, 1987	21.73	55.28		21.55	55.64	
144	Jul 23, 1987	21.23	54.73		21.23	55.08	
145	Jul 24, 1987	20.58	53.28		20.57	53.15	
146	Jul 27, 1987	20.5	53.05		20.49	53.21	
147	Jul 28, 1987	21.35	54.63		21.32	55.01	
148	Jul 29, 1987	21.49	54.53		21.44	54.77	
149	Jul 30, 1987	21.47	54.48		21.36	54.56	
150	Jul 31, 1987	21.43	54.38		21.37	54.65	
151	Aug 03, 1987	22.21	56.58		22.16	56.95	
152	Aug 04, 1987	21.82	55.83		21.97	56.4	
153	Aug 05, 1987	21.37	55.13		21.29	55.49	
154	Aug 06, 1987	21.17	54.88		21.14	55.28	
155	Aug 07, 1987	21.01	54.53		20.99	54.9	
156	Aug 10, 1987	20.7	53.63		20.73	54.01	
157	Aug 11, 1987	21.07	54.13		20.99	54.55	
158	Aug 12, 1987	20.96	54.05		20.99	54.58	
159	Aug 13, 1987	20.76	53.63		20.77	54.17	
160	Aug 14, 1987	20.53	53.03		20.57	53.58	
161	Aug 17, 1987	19.85	51.38		19.83	51.62	
162	Aug 18, 1987	19.84	51.05		19.9	51.73	
163	Aug 19, 1987	19.71	50.78		19.63	51.15	
164	Aug 20, 1987	19.47	49.88		19.42	50.31	
165	Aug 21, 1987	19.2	49.38		18.9	49.84	
166	Aug 24, 1987	19.18	48.88		18.6	49	
167	Aug 25, 1987	19.3	48.55		18.64	49.05	
168	Aug 26, 1987	19.49	51		19.46	51.18	
169	Aug 27, 1987	19.69	51.48		19.64	51.72	
170	Aug 28, 1987	19.44	50.88		19.39	51.29	
171	Aug 31, 1987	19.76	51.88		19.73	52.11	
172	Sep 01, 1987	19.61	51.98		19.63	52.23	
173	Sep 02, 1987	19.62	51.88		19.64	52.41	
174	Sep 03, 1987	19.48	52.05		19.5	52.2	
175	Sep 04, 1987	19.34	51.48		19.32	51.83	
176	Sep 07, 1987	19.34					
177	Sep 08, 1987	18.99	50.73		18.94	50.85	
178	Sep 09, 1987	19.43	52.05		19.38	52.31	
179	Sep 10, 1987	19.72	52.43		19.67	52.92	
180	Sep 11, 1987	19.42	52.03		19.4	52.41	
181	Sep 14, 1987	19.64	52.53		19.61	52.97	
182	Sep 15, 1987	19.66	51.88		19.7	52.6	
183	Sep 16, 1987	19.71	51.88		19.73	52.3	
184	Sep 17, 1987	19.58	51.53		19.56	51.91	
185	Sep 18, 1987	19.58	51.68		19.55	52.08	
186	Sep 21, 1987	19.77	51.88		19.73	52.27	
187	Sep 22, 1987	19.35	51.88		19.25	52.08	
188	Sep 23, 1987	19.66	52.78		19.68	53.23	
189	Sep 24, 1987	19.61	53.13		19.65	53.48	
190	Sep 25, 1987	19.47	52.98		19.46	53.37	
191	Sep 28, 1987	19.48	52.98		19.45	53.4	
192	Sep 29, 1987	19.58	53.73		19.54	54.15	
193	Sep 30, 1987	19.62	53.95		19.59	54.12	
194	Oct 01, 1987	19.62	54.38		19.62	54.82	
195	Oct 02, 1987	19.88	55.23		19.86	55.56	
196	Oct 05, 1987	19.81	55.53		19.82	55.93	
197	Oct 06, 1987	19.33	54.68		19.44	54.82	
198	Oct 07, 1987	19.68	55.38		19.66	55.74	
199	Oct 08, 1987	19.77	55.83		19.59	55.74	
200	Oct 09, 1987	19.67	55.53		19.7	55.84	
201	Oct 12, 1987	19.67	55.53		19.65	55.8	
202	Oct 13, 1987	19.66	55.73		19.7	55.7	
203	Oct 14, 1987	19.79	55.88		19.77	56.03	
204	Oct 15, 1987	19.77	55.88		19.75	56.08	
205	Oct 16, 1987	20.23	57.45		20.22	57.66	
206	Oct 19, 1987	19.79	56.23		19.8	56.65	
207	Oct 20, 1987	19.79	56.73		19.87	56.33	
208	Oct 21, 1987	19.93	56.88		20.05	57.12	
209	Oct 22, 1987	20.19	57.63		20.2	57.67	
210	Oct 23, 1987	20.18	57.28		20.16	57.47	
211	Oct 26, 1987	20	56.68		19.99	56.89	
212	Oct 27, 1987	20.15	57.25		20.12	57.36	
213	Oct 28, 1987	20.1	57.53		20.08	57.64	
214	Oct 29, 1987	19.93	57.15		19.97	57.28	

No	Tanggal	Cushing, OK WTI Spot Price FOB (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Spot Price FOB (Cents per Gallon)	Mont Belvieu, TX Propane Spot Price FOB (Cents per Gallon)	Cushing, OK Crude Oil Future Contract 1 (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Future Contract 1 (Cents per Gallon)	Mont Belvieu, Tx Propane Future Contract 1 (Cents per Gallon)
215	Oct 30, 1987	19.96	57.33		19.96	57.46	
216	Nov 02, 1987	19.64	56.48		19.62	56.57	
217	Nov 03, 1987	19.39	56.15		19.49	56.21	
218	Nov 04, 1987	19.09	55.13		19.07	55.23	
219	Nov 05, 1987	19.02	55.28		18.98	55.29	
220	Nov 06, 1987	18.73	55.53		18.8	55.36	
221	Nov 09, 1987	18.66	55.15		18.63	54.83	
222	Nov 10, 1987	18.98	56.33		18.94	55.85	
223	Nov 11, 1987	18.92	57.03		18.9	57.03	
224	Nov 12, 1987	18.93	56.95		18.91	56.81	
225	Nov 13, 1987	18.89	56.28		18.93	56.17	
226	Nov 16, 1987	18.69	56		18.65	55.84	
227	Nov 17, 1987	18.28	54.88		18.4	55.2	
228	Nov 18, 1987	18.62	55.05		18.64	54.94	
229	Nov 19, 1987	18.55	55.05		18.57	54.94	
230	Nov 20, 1987	18.87	55.73		18.93	55.47	
231	Nov 23, 1987	19.31	56.13		18.78	55.74	
232	Nov 24, 1987	18.73	55.88		18.71	55.46	
233	Nov 25, 1987	18.63	56.38		18.62	55.97	
234	Nov 26, 1987						
235	Nov 27, 1987	18.63	56.38				
236	Nov 30, 1987	18.52	56.38		18.51	55.92	
237	Dec 01, 1987	18.44	56		18.46	54.86	
238	Dec 02, 1987	18.59	56.78		18.56	55.67	
239	Dec 03, 1987	18.87	58.03		18.87	56.67	
240	Dec 04, 1987	18.68	57.48		18.74	56.26	
241	Dec 07, 1987	18.3	56.13		18.25	54.93	
242	Dec 08, 1987	18.06	54.88		18.08	54.07	
243	Dec 09, 1987	18.53	55.88		18.55	54.82	
244	Dec 10, 1987	18.51	56.15		18.51	55.03	
245	Dec 11, 1987	18.31	56.03		18.31	54.93	
246	Dec 14, 1987	17.47	54.33		17.44	53.36	
247	Dec 15, 1987	16.75	52.18		16.63	51	
248	Dec 16, 1987	15.97	50.38		15.96	49.27	
249	Dec 17, 1987	15.97	50.63		15.84	49.61	
250	Dec 18, 1987	15.57	49.88		15.58	48.73	
251	Dec 21, 1987	15.12	50.38		15.16	49.35	
252	Dec 22, 1987	16.6	52.95		16.61	51.97	
253	Dec 23, 1987	16.64	52.2		16.64	51.55	
254	Dec 24, 1987	16.54	52.15		16.52	51.25	
255	Dec 28, 1987	16.46	51.38		16.42	51.13	
256	Dec 29, 1987	16.95	51.85		16.93	51.89	
257	Dec 30, 1987	16.97	51.1		16.89	51.18	
258	Dec 31, 1987	16.74	51.33		16.7	51.44	
1802	Dec 30, 1993	14.19	44.28	25.13	14.17	44.16	24.95
1803	Dec 31, 1993						
1804	Jan 03, 1994	14.52	45.23	24.88	14.56	45.21	24.85
1805	Jan 04, 1994	14.66	46.08	24.88	14.67	46.03	25.1
1806	Jan 05, 1994	15.3	47.78	25.63	15.34	47.88	26.2
1807	Jan 06, 1994	15.36	48.03	25.63	15.42	47.65	25.9
1808	Jan 07, 1994	15.33	48.53	25.88	15.32	48.17	26
1809	Jan 10, 1994	14.65	47.28	25.88	14.67	46.76	25.75
1810	Jan 11, 1994	14.95	49.43	25.88	14.85	48.42	25.75
1811	Jan 12, 1994	14.36	49.18	26	14.33	48.07	25.5
1812	Jan 13, 1994	14.56	49.88	25.88	14.51	48.91	25.8
1813	Jan 14, 1994	14.81	52.23	26.25	14.78	51.26	26.4
1814	Jan 17, 1994	15.15	53.63	27	15.1	52.67	27.1
1815	Jan 18, 1994	14.92	49.88	26.63	14.87	49.49	26.55
1816	Jan 19, 1994	15.25	50.68	26.75	15.22	50.08	26.5
1817	Jan 20, 1994	14.95	48.08	26.88	15.1	47.96	26.5
1818	Jan 21, 1994	14.85	48.28	26.13	14.94	48.03	26.2
1819	Jan 24, 1994	15.09	49.78	25.88	15.17	49.39	26.1
1820	Jan 25, 1994	15.26	50.93	26.38	15.17	49.9	26.4
1821	Jan 26, 1994	15.5	52.93	26.88	15.47	52.31	27.1
1822	Jan 27, 1994	15.48	53.68	27.38	15.42	53.06	27.75
1823	Jan 28, 1994	15.37	53.18	27.38	15.34	52.7	27.75
1824	Jan 31, 1994	15.24	54.18	28.63	15.19	53.7	28.6
1825	Feb 01, 1994	15.91	56.83	29.88	15.92	51.83	28.99
1826	Feb 02, 1994	16.06	59.35	31.63	16.04	53.58	30.6
1827	Feb 03, 1994	15.97	60.68	31.38	15.89	52.3	29.5
1828	Feb 04, 1994	15.63	58.8	29.75	15.63	51.06	28.75
1829	Feb 07, 1994	15.31	58.25	29.63	15.25	49.98	28.25
1830	Feb 08, 1994	15.12	60.8	29.63	15.21	50.57	28.45
1831	Feb 09, 1994	14.64	60.9	29.13	14.6	49.4	27.75
1832	Feb 10, 1994	14.59	61.55	29.13	14.56	50.31	27.65
1833	Feb 11, 1994	14.71	62.75	29.13	14.72	50.98	28
1834	Feb 14, 1994	14.15	57.3	28.25	14.13	47.82	27.25
1835	Feb 15, 1994	14.13	53.43	27.88	14.06	47.05	27.25
1836	Feb 16, 1994	13.89	51	27.63	13.93	45.02	27.1
1837	Feb 17, 1994	14.26	48.5	27.38	14.23	45.24	26.85
1838	Feb 18, 1994	14.21	48.73	27.38	14.21	45.75	27.25
1839	Feb 21, 1994						
1840	Feb 22, 1994	14.28	50.1	27.88	14.24	46.83	27.8
1841	Feb 23, 1994	14.18	50.43	28.38	14.41	47.22	28.5
1842	Feb 24, 1994	14.82	52.98	29.13	14.77	48.86	28.71
1843	Feb 25, 1994	14.48	53.83	29.38	14.57	49.68	28.7
1844	Feb 28, 1994	14.5	51.55	28.63	14.48	50.28	28.5
1845	Mar 01, 1994	14.78	52.95	27.88	14.67	45.55	27.65
1846	Mar 02, 1994	14.8	52.25	28.38	14.76	45.74	27.9
1847	Mar 03, 1994	14.74	51.88	28.13	14.75	45.66	27.6
1848	Mar 04, 1994	14.57	51.28	28	14.57	44.89	27.4
1849	Mar 07, 1994	14.14	50.1	28	14.1	43.37	27.25
1850	Mar 08, 1994	14.17	49.83	27.88	14.1	43.35	27.2
1851	Mar 09, 1994	14.23	49.68	27.88	14.18	43.79	27.35
1852	Mar 10, 1994	14.19	48.93	27.88	14.14	43.28	27.35
1853	Mar 11, 1994	14.47	48.58	28.5	14.44	43.7	27.9
1854	Mar 14, 1994	14.52	47.23	28.63	14.49	43.36	27.75
1855	Mar 15, 1994	14.82	47.68	28.88	14.83	44.63	27.95
1856	Mar 16, 1994	15.03	47.73	28.88	15.06	44.47	28.05
1857	Mar 17, 1994	14.83	47.93	28.88	14.82	44.24	28.1
1858	Mar 18, 1994	14.88	48.08	28.88	14.88	44.47	28.15
1859	Mar 21, 1994	15.37	49.23	29.13	15.37	45.09	28.3
1860	Mar 22, 1994	15.04	48.63	29.13	15.2	45.2	28.5
1861	Mar 23, 1994	14.94	48.88	29.13	14.9	45.02	28.2
1862	Mar 24, 1994	15.21	48.93	28.63	15.08	45.21	28.15
1863	Mar 25, 1994	15.19	50.18	28.63	15.13	46.28	28.25
1864	Mar 28, 1994	14.15	47.38	27.75	14.08	43.76	27.1
1865	Mar 29, 1994	14.41	47.73	28.13	14.32	44.6	27.9

No	Tanggal	Cushing, OK WTI Spot Price FOB (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Spot Price FOB (Cents per Gallon)	Mont Belvieu, TX Propane Spot Price FOB (Cents per Gallon)	Cushing, OK Crude Oil Future Contract 1 (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Future Contract 1 (Cents per Gallon)	Mont Belvieu, Tx Propane Future Contract 1 (Cents per Gallon)
1866	Mar 30, 1994	14.4	48.93	27.88	14.38	45.04	27.8
1867	Mar 31, 1994	14.78	48.43	28.13	14.79	45.8	28
1868	Apr 04, 1994	15.67	50.53	28.63	15.79	46.17	28.5
1869	Apr 05, 1994	15.67	49.7	28.38	15.74	45.82	28.5
1870	Apr 06, 1994	15.77	48.88	28.88	15.77	45.51	28.75
1871	Apr 07, 1994	15.59	47.68	28.63	15.58	44.81	28.75
1872	Apr 08, 1994	15.57	46.93	28.5	15.57	45.06	28.5
1873	Apr 11, 1994	15.86	47.43	28.38	15.87	45.82	28.45
1874	Apr 12, 1994	15.74	46.98	28.38	15.75	45.48	28.45
1875	Apr 13, 1994	15.96	47.08	28.38	15.97	45.82	28.45
1876	Apr 14, 1994	16.2	47.93	28.63	16.23	46.7	28.5
1877	Apr 15, 1994	16.58	48.63	28.63	16.58	47.4	29
1878	Apr 18, 1994	16.64	48.28	28.63	16.65	47.03	29
1879	Apr 19, 1994	16.43	47.18	28.63	16.49	46.17	28.8
1880	Apr 20, 1994	16.65	47.28	28.63	16.82	46.4	28.7
1881	Apr 21, 1994	17.56	47.48	29	16.63	46.87	29.1
1882	Apr 22, 1994	17.84	48.23	29.63	17.14	47.87	29.7
1883	Apr 25, 1994	17.66	48.63	29.38	17.24	48.23	29.7
1884	Apr 26, 1994	16.82	47.48	29.88	16.91	47.37	29.9
1885	Apr 27, 1994	16.7	47.53	29.38			
1886	Apr 28, 1994	16.57	46.53	29.5	16.57	46.52	29.65
1887	Apr 29, 1994	16.92	47.13	29.38	16.9	47.05	29.56
1888	May 02, 1994	17.18	47.63	29.25	17.16	47.57	29.65
1889	May 03, 1994	16.93	47.08	29.38	16.89	46.89	29.5
1890	May 04, 1994	16.85	46.78	29.63	16.86	46.66	29.75
1891	May 05, 1994	17.28	47.43	29.88	17.29	47.31	30
1892	May 06, 1994	17.74	48.23	30.13	17.7	48.1	30.5
1893	May 09, 1994	17.72	48.58	30.38	17.73	48.34	30.5
1894	May 10, 1994	17.62	47.88	30.63	17.61	47.82	30.56
1895	May 11, 1994	17.84	48.13	30.63	17.85	47.85	30.7
1896	May 12, 1994	18.27	48.43	30.13	18.28	48.22	30.45
1897	May 13, 1994	18.2	48.48	30.13	18.21	48.47	30.3
1898	May 16, 1994	17.99	47.83	29.63	18.06	47.81	29.75
1899	May 17, 1994	17.61	47.03	29.38	17.59	47.04	29.5
1900	May 18, 1994	18.02	47.48	29.38	17.99	47.7	29.5
1901	May 19, 1994	18.49	47.63	29.63	18.45	47.86	29.5
1902	May 20, 1994	18.93	48.03	29.63	18.92	48.32	29.65
1903	May 23, 1994	18.69	47.68	29.63	18.06	47.91	29.5
1904	May 24, 1994	18.4	47.58	29.38	17.92	47.6	29.35
1905	May 25, 1994	17.83	47.53	29.13	17.7	47.63	29
1906	May 26, 1994	17.76	47.68	28.63	17.74	47.82	28.75
1907	May 27, 1994	18.02	48.28	28.88	18.03	48.38	28.8
1908	May 31, 1994	18.3	49.58	28.63	18.31	49.71	28.63
1909	Jun 01, 1994	18.29	49.08	28.63	18.21	49.43	28.8
1910	Jun 02, 1994	18.25	48.38	29.13	18.23	48.5	29.15
1911	Jun 03, 1994	18.11	48.18	29	18.12	48.22	29
1912	Jun 06, 1994	18.1	47.58	28.88	18.11	47.56	29
1913	Jun 07, 1994	17.78	46.33	28.63	17.75	46.47	28.75
1914	Jun 08, 1994	18.28	46.73	28.63	18.34	46.62	28.75
1915	Jun 09, 1994	18.67	47.13	28.63	18.67	46.99	28.9
1916	Jun 10, 1994	18.48	47.03	28.63	18.48	46.91	28.65
1917	Jun 13, 1994	18.82	47.78	28.38	18.79	47.64	28.5
1918	Jun 14, 1994	18.94	48.23	28.38	18.95	47.93	28.5
1919	Jun 15, 1994	19.75	50.73	28.63	19.86	50.58	28.75
1920	Jun 16, 1994	19.83	50.58	28.88	19.91	50.52	29
1921	Jun 17, 1994	20.72	52.08	29.13	20.71	52.02	29.35
1922	Jun 20, 1994	20.68	51.53	29.13	20.75	51.47	29.35
1923	Jun 21, 1994	20.08	50.53	29.38	20.04	50.46	29.5
1924	Jun 22, 1994	19.59	49.98	29.38	19.37	49.83	29.6
1925	Jun 23, 1994	19.38	50.83	29.13	19.42	50.68	29.4
1926	Jun 24, 1994	19.28	50.53	29.13	19.32	50.39	29.1
1927	Jun 27, 1994	18.96	49.68	28.38	19.01	49.54	28.9
1928	Jun 28, 1994	19.14	50.03	28.5	19.27	49.95	28.7
1929	Jun 29, 1994	18.82	49.73	28.63	18.83	49.58	28.65
1930	Jun 30, 1994	19.37	50.63	28.63	19.37	50.59	28.7
1931	Jul 01, 1994	19.52	50.73	28.88	19.53	50.78	28.8
1932	Jul 04, 1994						
1933	Jul 05, 1994	19.62	50.18	28.88	19.62	50.32	28.8
1934	Jul 06, 1994	19.3	48.98	28.88	19.24	49.09	29.1
1935	Jul 07, 1994	19.15	48.03	28.88	19.12	48.18	29.15
1936	Jul 08, 1994	19.48	48.63	28.88	19.48	48.79	29.25
1937	Jul 11, 1994	20.17	49.33	29.13	20.18	49.7	29.6
1938	Jul 12, 1994	20.4	49.88	29.38	20.43	50.44	29.6
1939	Jul 13, 1994	20.14	49.83	29.38	20.15	50.21	29.5
1940	Jul 14, 1994	20.18	50.13	29.38	20.18	50.49	29.75
1941	Jul 15, 1994	19.89	49.33	29.13	19.89	49.82	29.4
1942	Jul 18, 1994	19.38	48.43	29	19.51	48.84	29.35
1943	Jul 19, 1994	19.49	49.18	28.88	19.46	49.48	29.25
1944	Jul 20, 1994	19.15	49.43	29.13	19.2	49.63	29.35
1945	Jul 21, 1994	19.32	49.78	29.13	19.39	49.94	29.35
1946	Jul 22, 1994	19.59	50.43	29.13	19.61	50.57	29.55
1947	Jul 25, 1994	19.42	50.03	29.38	19.41	50.17	29.75
1948	Jul 26, 1994	19.26	50.13	29.38	19.21	49.99	29.75
1949	Jul 27, 1994	19.46	50.38	29.88	19.46	50.39	30
1950	Jul 28, 1994	19.87	51.08	29.75	19.77	50.69	30
1951	Jul 29, 1994	20.3	53.18	30.13	20.3	52.9	30.3
1952	Aug 01, 1994	20.65	54.13	30.63	20.55	54.26	31
1953	Aug 02, 1994	20.22	53.08	30.38	20.14	53.02	30.5
1954	Aug 03, 1994	20.06	52.38	30.38	20.1	52.6	30.75
1955	Aug 04, 1994	20.14	51.83	30.38	20.14	52.05	30.75
1956	Aug 05, 1994	19.37	48.83	30.25	19.31	49.18	30.5
1957	Aug 08, 1994	19.41	49.48	30.38	19.42	49.85	30.7
1958	Aug 09, 1994	19.29	49.68	30.38	19.3	50.17	30.7
1959	Aug 10, 1994	18.96	49.78	30.38	18.96	50.14	30.7
1960	Aug 11, 1994	18.67	49.33	30.25	18.66	49.72	30.65
1961	Aug 12, 1994	18.05	48.18	30.13	18.05	48.57	30.2
1962	Aug 15, 1994	18.24	48.73	30	18.2	49.1	30.35
1963	Aug 16, 1994	17.64	48.23	30.13	17.73	48.54	30.4
1964	Aug 17, 1994	18.08	49.63	30.13	18.11	49.77	30.05
1965	Aug 18, 1994	17.73	48.58	30.13	17.72	48.7	30.25
1966	Aug 19, 1994	17.56	47.93	29.88	17.58	48.03	30.15
1967	Aug 22, 1994	16.87	47.18	29.63	16.87	47.3	29.8
1968	Aug 23, 1994	17.09	47.68	29.5	17.09	47.81	29.75
1969	Aug 24, 1994	17.54	48.58	29.63	17.49	48.55	29.75
1970	Aug 25, 1994	17.49	48.98	29.63	17.52	48.77	29.65
1971	Aug 26, 1994	17.14	48.33	29.38	17.14	48.18	29.25
1972	Aug 29, 1994	17.62	49.23	29.13	17.63	48.84	29.25
1973	Aug 30, 1994	17.4	48.83	29.13	17.45	48.55	29.7

No	Tanggal	Cushing, OK WTI Spot Price FOB (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Spot Price FOB (Cents per Gallon)	Mont Belvieu, TX Propane Spot Price FOB (Cents per Gallon)	Cushing, OK Crude Oil Future Contract 1 (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Future Contract 1 (Cents per Gallon)	Mont Belvieu, Tx Propane Future Contract 1 (Cents per Gallon)
1974	Aug 31, 1994	17.6	49.28	29.38	17.56	49.39	29.71
1975	Sep 01, 1994	17.47	49.18	29.63	17.47	49.28	29.85
1976	Sep 02, 1994	17.52	49.58	29.63	17.52	49.72	29.85
1977	Sep 05, 1994						
1978	Sep 06, 1994	17.62	49.58	29.5	17.62	49.95	29.85
1979	Sep 07, 1994	17.84	49.43	29.88	17.81	50.07	30.05
1980	Sep 08, 1994	17.62	48.88	29.88	17.67	49.63	30.15
1981	Sep 09, 1994	17.53	48.58	29.88	17.53	49.37	30.5
1982	Sep 12, 1994	17.39	48.23	29.88	17.39	49.07	30.6
1983	Sep 13, 1994	17	46.98	29.88	17.12	48.12	30.49
1984	Sep 14, 1994	16.72	45.93	29.63	16.71	47.03	30
1985	Sep 15, 1994	16.72	45.58	29.63	16.7	46.71	30.2
1986	Sep 16, 1994	16.84	45.88	29.88	16.83	47.01	30.25
1987	Sep 19, 1994	17.21	47.33	29.88	17.21	48.32	30.25
1988	Sep 20, 1994	17.24	46.93	29.88	17.24	48.35	30.2
1989	Sep 21, 1994	17.06	46.53	29.88	17.22	47.65	30.25
1990	Sep 22, 1994	17.65	47.43	29.63	17.67	48.54	30.25
1991	Sep 23, 1994	17.76	47.43	29.88	17.83	48.55	30.2
1992	Sep 26, 1994	17.68	46.68	29.88	17.67	47.78	30.25
1993	Sep 27, 1994	17.48	46.68	30.13	17.55	47.66	30.3
1994	Sep 28, 1994	17.69	47.48	30.38	17.68	48.33	30.45
1995	Sep 29, 1994	17.96	48.68	30.63	17.98	49.32	30.75
1996	Sep 30, 1994	18.36	49.63	30.88	18.39	50.22	31
1997	Oct 03, 1994	18.16	48.88	31.13	18.19	50.24	31.5
1998	Oct 04, 1994	17.97	48.13	31.63	18.08	49.75	32
1999	Oct 05, 1994	18.01	48.58	31.88	18.01	49.95	32
2000	Oct 06, 1994	18.24	48.88	32.38	18.25	50.24	32.75
2001	Oct 07, 1994	18.27	48.98	32.88	18.26	50.43	33.1
2002	Oct 10, 1994	17.95	48.33	33.13	17.99	49.59	32.85
2003	Oct 11, 1994	17.74	47.38	32.38	17.7	48.73	32.6
2004	Oct 12, 1994	17.13	45.73	32.25	17.19	46.76	32.5
2005	Oct 13, 1994	17.03	46.33	32.63	17.13	46.85	32.25
2006	Oct 14, 1994	16.98	46.18	31.88	16.97	46.71	32.25
2007	Oct 17, 1994	17.11	46.68	32.13	17.06	47.15	32.35
2008	Oct 18, 1994	17.34	47.43	32.38	17.22	47.38	32.75
2009	Oct 19, 1994	17.43	47.78	32.38	17.42	48.21	32.75
2010	Oct 20, 1994	17.57	49.65	32.63	17.54	50.04	32.8
2011	Oct 21, 1994	17.31	48.58	32.63	17.38	48.49	33
2012	Oct 24, 1994	17.5	49.13	32.38	17.45	49.16	32.9
2013	Oct 25, 1994	17.71	49.18	32.13	17.58	49.3	32.55
2014	Oct 26, 1994	18.01	49.23	32.63	17.95	49.48	32.95
2015	Oct 27, 1994	18.17	49.08	32.88	18.15	49.4	33.2
2016	Oct 28, 1994	18.25	48.98	33	18.23	49.31	33.2
2017	Oct 31, 1994	18.16	48.68	33.13	18.19	48.98	33.2
2018	Nov 01, 1994	18.66	50.23	33.25	18.68	50.72	33.7
2019	Nov 02, 1994	18.9	50.48	33.75	18.93	51.2	34
2020	Nov 03, 1994	18.97	50.88	34.13	18.9	51.42	34.4
2021	Nov 04, 1994	18.76	50.48	34.38	18.76	51	34.65
2022	Nov 07, 1994	18.38	49.98	34.63	18.39	50.44	34.25
2023	Nov 08, 1994	18.46	50.33	33.5	18.58	51.08	34.03
2024	Nov 09, 1994	18.16	50.18	33.38	18.16	50.57	33.75
2025	Nov 10, 1994	18.18	50.53	33.38	18.19	50.8	34.4
2026	Nov 11, 1994	18.07	49.98	34.38	18.04	50.34	34.6
2027	Nov 14, 1994	17.48	48.48	34.38	17.47	48.85	34.6
2028	Nov 15, 1994	17.58	48.38	34.63	17.58	48.6	34.8
2029	Nov 16, 1994	17.38	47.43	34.75	17.37	47.76	34.6
2030	Nov 17, 1994	17.63	47.88	34.25	17.65	48.14	34.6
2031	Nov 18, 1994	17.47	47.73	34.75	17.47	48.08	35.25
2032	Nov 21, 1994	17.43	48.18	35.25	17.56	48.56	35.25
2033	Nov 22, 1994	17.7	48.78	35.13	17.82	49.15	35.35
2034	Nov 23, 1994	18.05	50.38	35.13	18.15	50.87	35.49
2035	Nov 24, 1994						
2036	Nov 25, 1994						
2037	Nov 28, 1994	18.1	50.38	35.88	18.12	50.58	35.75
2038	Nov 29, 1994	17.97	49.33	35.25	18.05	49.97	35.4
2039	Nov 30, 1994	18.06	48.63	34.63	18.05	48.96	35
2040	Dec 01, 1994	17.77	47.98	34.38	17.82	48.75	34.4
2041	Dec 02, 1994	17	45.93	32.88	16.99	47.02	32.9
2042	Dec 05, 1994	16.88	46.03	32.38	16.85	47.01	32.75
2043	Dec 06, 1994	16.93	46.43	32.88	16.94	47.29	33.45
2044	Dec 07, 1994	16.86	46.93	32.88	16.87	47.67	33.66
2045	Dec 08, 1994	17.14	48.63	33.5	17.12	49.11	34.26
2046	Dec 09, 1994	17.12	49.13	34.13	17.13	49.27	34.35
2047	Dec 12, 1994	16.92	48.88	34.63	16.91	48.85	34.75
2048	Dec 13, 1994	16.98	49.28	34.13	16.91	48.48	34.5
2049	Dec 14, 1994	16.96	49.58	34.38	16.99	49.54	34.45
2050	Dec 15, 1994	16.6	48.78	34.38	16.73	48.78	34.7
2051	Dec 16, 1994	16.84	48.33	33.75	16.76	48.46	34.25
2052	Dec 19, 1994	16.91	47.63	33.88	16.91	47.86	33.9
2053	Dec 20, 1994	16.98	47.63	33.13	16.98	47.88	33.1
2054	Dec 21, 1994	17.07	47.58	32.5	17.02	47.86	32.75
2055	Dec 22, 1994	17.15	47.68	32.38	17.09	47.95	33
2056	Dec 23, 1994	17.41	47.73	32.38	17.35	48.02	33.1
2057	Dec 27, 1994	17.63	48.98	32.38	17.64	49.25	32.98
2058	Dec 28, 1994	17.74	49.98	32.88	17.79	50.11	33.1
2059	Dec 29, 1994	17.69	50.63	33.13	17.72	50.66	33.3
2060	Dec 30, 1994	17.77	51.43	33.13	17.76	51.31	33.29
5149	Dec 29, 2006	60.85	160.05	91.32	61.05	159.79	92
5150	Jan 02, 2007	60.77	166.35				
5151	Jan 03, 2007	58.31	152.9	86.5	58.32	158.81	89.25
5152	Jan 04, 2007	55.65	148.73	85	55.59	154.31	85.5
5153	Jan 05, 2007	56.29	152.28	87	56.31	156.58	85.5
5154	Jan 08, 2007	56.08	150.61	88.5	56.09	155.71	87.25
5155	Jan 09, 2007	55.65	151.35	88.25	55.64	155.65	86.75
5156	Jan 10, 2007	53.95	146.94	87.5	54.02	152.55	87.75
5157	Jan 11, 2007	51.91	144.9	85.5	51.88	148.04	87.25
5158	Jan 12, 2007	52.96	146.71	86.88	52.99	150.36	86
5159	Jan 16, 2007	51.23	144.7	86.75	51.21	148.03	86
5160	Jan 17, 2007	52.3	146.85	87.19	52.24	149.98	86
5161	Jan 18, 2007	50.51	144.61	85.88	50.48	147.07	85.25
5162	Jan 19, 2007	51.98	149.33	88.38	51.99	151.35	88
5163	Jan 22, 2007	51.11	148.9	88.38	51.13	150.84	89.25
5164	Jan 23, 2007	53.61	155.1	91.07	55.04	157.63	89
5165	Jan 24, 2007	54.24	155.75	91	55.37	158.39	90
5166	Jan 25, 2007	53.49	155.22	91.44	54.23	154.91	91
5167	Jan 26, 2007	55.38	159.11	93.75	55.42	159.14	93.25
5168	Jan 29, 2007	54.01	155.19	94.13	54.01	154.89	94.75
5169	Jan 30, 2007	57.03	164.26	96.44	56.97	163.8	95.5

No	Tanggal	Cushing, OK WTI Spot Price FOB (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Spot Price FOB (Cents per Gallon)	Mont Belvieu, TX Propane Spot Price FOB (Cents per Gallon)	Cushing, OK Crude Oil Future Contract 1 (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Future Contract 1 (Cents per Gallon)	Mont Belvieu, Tx Propane Future Contract 1 (Cents per Gallon)
5170	Jan 31, 2007	58.17	168.13	95.5	58.14	165.46	95.25
5171	Feb 01, 2007	57.35	165.65	95.88	57.3	165.89	93.75
5172	Feb 02, 2007	59.01	168.26	97.5	59.02	168.4	93.75
5173	Feb 05, 2007	58.69	167.75	98.19	58.74	167.56	96.5
5174	Feb 06, 2007	58.91	169.2	98.07	58.88	169.09	97
5175	Feb 07, 2007	57.75	167.03	98.5	57.71	166.61	97.5
5176	Feb 08, 2007	59.76	172.37	99.94	59.71	172.5	96.5
5177	Feb 09, 2007	59.86	172.36	101.19	59.89	172.51	98.5
5178	Feb 12, 2007	57.76	164.08	98.38	57.81	164.54	96.25
5179	Feb 13, 2007	58.98	169.2	98.69	59.06	169.32	96.25
5180	Feb 14, 2007	58	163.95	97	58	163.83	96.25
5181	Feb 15, 2007	57.92	162.66	94.63	57.99	162.71	94
5182	Feb 16, 2007	59.38	166.56	95.25	59.39	167.34	93.75
5183	Feb 20, 2007	58.32	164.36	93.32	58.07	164.5	92.75
5184	Feb 21, 2007	59.4	168.2	94.13	60.07	168.16	92.75
5185	Feb 22, 2007	60.28	172.05	96.75	60.95	172.5	94.5
5186	Feb 23, 2007	60.28	174.45	98.44	61.14	175.05	94.5
5187	Feb 26, 2007	61.41	175.3	99.88	61.39	175.62	99.5
5188	Feb 27, 2007	61.46	175.35	99	61.46	177.93	100
5189	Feb 28, 2007	61.78	178.05	98.63	61.79	178.04	99.5
5190	Mar 01, 2007	61.97	177.7	98.5	62	177.63	98
5191	Mar 02, 2007	61.58	176.33	98.25	61.64	176.82	98.75
5192	Mar 05, 2007	60.05	172.47	98.25	60.07	172.48	97.75
5193	Mar 06, 2007	60.66	174.88	99	60.69	174.73	98.5
5194	Mar 07, 2007	61.85	176.65	102.38	61.82	176.74	100
5195	Mar 08, 2007	61.63	176.25	104.25	61.64	176.13	101.5
5196	Mar 09, 2007	60.06	171.22	103.88	60.05	171.22	101.5
5197	Mar 12, 2007	58.94	168.6	103.44	58.91	168.23	100
5198	Mar 13, 2007	58.03	170.03	103.44	57.93	169.02	102
5199	Mar 14, 2007	58.15	170.73	103.44	58.16	170.9	101
5200	Mar 15, 2007	57.52	168.58	104.88	57.55	168.85	102
5201	Mar 16, 2007	57.06	169.58	104.88	57.11	168.88	100.5
5202	Mar 19, 2007	56.65	169.48	102.32	56.59	168.84	100
5203	Mar 20, 2007	56.41	167.75	102.32	56.73	166.87	100
5204	Mar 21, 2007	56.98	167.34	103.5	59.61	166.46	100
5205	Mar 22, 2007	60.21	171.86	103.63	61.69	171.8	101.5
5206	Mar 23, 2007	61.07	171.1	103.88	62.28	171.11	102
5207	Mar 26, 2007	61.77	177.05	105.88	62.91	177.61	104
5208	Mar 27, 2007	62.98	178.39	106.38	62.93	178.64	104.5
5209	Mar 28, 2007	64.11	181.35	108.63	64.08	182.74	107.75
5210	Mar 29, 2007	66.1	186.95	110.88	66.03	187.72	108.75
5211	Mar 30, 2007	65.94	187.05	109.5	65.87	187.94	109.25
5212	Apr 02, 2007	66.03	185.88	108.25	65.94	186.25	108
5213	Apr 03, 2007	64.59	183.38	106.38	64.64	183.87	106
5214	Apr 04, 2007	64.4	186.5	106.38	64.38	186.44	105
5215	Apr 05, 2007	64.26	185.85	106.57	64.28	186.09	106
5216	Apr 09, 2007	61.51	182.21	105.94	61.51	181.57	106.25
5217	Apr 10, 2007	61.92	186.18	106.69	61.89	185.61	106.25
5218	Apr 11, 2007	61.98	187.26	107.75	62.01	187.47	106.75
5219	Apr 12, 2007	63.87	191.27	110.75	63.85	190.61	109
5220	Apr 13, 2007	63.63	189.66	111.19	63.63	190.07	110.75
5221	Apr 16, 2007	63.63	186.45	110.75	63.61	185.93	110
5222	Apr 17, 2007	63.14	180.95	110.38	63.1	179.78	110.25
5223	Apr 18, 2007	63.14	181.38	110.63	63.13	180.66	109.5
5224	Apr 19, 2007	61.81	181.11	111.5	61.83	180.58	109.5
5225	Apr 20, 2007	63.56	183.63	112.25	63.38	183.25	111
5226	Apr 23, 2007	65.33	189.56	114.13	65.89	189.43	112
5227	Apr 24, 2007	64.1	185.1	114.25	64.58	184.6	112.5
5228	Apr 25, 2007	65.33	190.35	116	65.84	190.15	113.75
5229	Apr 26, 2007	65.08	189.51	114.94	65.06	188.91	114.75
5230	Apr 27, 2007	66.45	191.35	115.69	66.46	191.35	115
5231	Apr 30, 2007	65.78	189.7	116.25	65.71	191.35	116
5232	May 01, 2007	64.43	189	115.75	64.4	188.29	115
5233	May 02, 2007	63.78	185.15	114.38	63.68	185.26	114
5234	May 03, 2007	63.23	185.57	113.5	63.19	184.53	114
5235	May 04, 2007	61.89	183.45	112.82	61.93	183.09	113
5236	May 07, 2007	61.48	180.8	111.94	61.47	180.29	111.5
5237	May 08, 2007	62.26	183.3	112.63	62.26	182.99	111.75
5238	May 09, 2007	61.54	182.35	112.57	61.55	181.58	111.75
5239	May 10, 2007	61.85	186.83	114.25	61.81	186.25	114
5240	May 11, 2007	62.35	188.61	114.44	62.37	188.23	114.25
5241	May 14, 2007	62.55	187.17	115.69	62.46	186.68	115.75
5242	May 15, 2007	63.16	188.92	115.63	63.17	189.02	115.5
5243	May 16, 2007	62.57	186.95	114.75	62.55	186.7	114
5244	May 17, 2007	64.83	193.17	117.19	64.86	193.67	115.25
5245	May 18, 2007	64.93	191.55	116.63	64.94	191.52	116.75
5246	May 21, 2007	66.25	194.88	117.25	66.27	195.09	117
5247	May 22, 2007	64.91	191.13	115.94	64.97	190.72	116.25
5248	May 23, 2007	65.1	193.28	115.88	65.77	193.23	115.75
5249	May 24, 2007	63.62	193	116	64.18	192.91	114.75
5250	May 25, 2007	64.59	194.16	117.38	65.2	193.91	116.5
5251	May 29, 2007	63.19	188.25	115	63.15	186.9	115.5
5252	May 30, 2007	63.47	187.25	115	63.49	187.55	114.75
5253	May 31, 2007	64.02	189.15	113.32	64.01	188.27	113.5

Lampiran 2 : Data *Return* Komoditas Energi

No	Tanggal	Cushing, OK WTI Spot Price FOB (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Spot Price FOB (Cents per Gallon)	Mont Belvieu, TX Propane Spot Price FOB (Cents per Gallon)	Cushing, OK Crude Oil Future Contract 1 (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Future Contract 1 (Cents per Gallon)	Mont Belvieu, Tx Propane Future Contract 1 (Cents per Gallon)
1	Dec 31, 1986						
2	Jan 02, 1987	0.011093	0.017499		0.010535	0.036346	
3	Jan 05, 1987	(0.008308)	(0.012734)		(0.009978)	(0.014900)	
4	Jan 06, 1987	0.012711	0.020459		0.014930	0.019818	
5	Jan 07, 1987	0.003837	0.010075		0.001645	0.004894	
6	Jan 08, 1987	0.018966	0.014924		0.017382	0.015117	
7	Jan 09, 1987	0.008019	0.024389		0.010712	0.019429	
8	Jan 12, 1987	0.011647	0.031309		0.012705	0.030652	
9	Jan 13, 1987	(0.007396)	(0.002806)		(0.006332)	(0.008082)	
10	Jan 14, 1987	0.014215	0.029533		0.012625	0.021530	
11	Jan 15, 1987	(0.002093)	0.002725		0.000523	0.000361	
12	Jan 16, 1987	0.002093	(0.001452)		(0.002092)	(0.002168)	
13	Jan 19, 1987	(0.022734)	(0.036442)		(0.021165)	(0.039655)	
14	Jan 20, 1987	0.001603	0.016257		0.001069	0.012341	
15	Jan 21, 1987	(0.006965)	(0.032401)		(0.001604)	(0.022743)	
16	Jan 22, 1987	0.008565	0.028687		0.009585	0.025712	
17	Jan 23, 1987	(0.009103)	(0.012543)		(0.005846)	(0.010805)	
18	Jan 26, 1987	0.002149	(0.019595)		(0.006417)	(0.022158)	
19	Jan 27, 1987	(0.008084)	(0.008683)		(0.009162)	(0.010588)	
20	Jan 28, 1987	0.004320	(0.017990)		0.005938	(0.011680)	
21	Jan 29, 1987	0.006445	0.007274		0.004296	0.008190	
22	Jan 30, 1987	0.002673	0.019975		0.004812	0.014078	
23	Feb 02, 1987	(0.007503)	(0.026855)		(0.011263)	(0.020703)	
24	Feb 03, 1987	(0.011361)	(0.011306)		(0.009756)	(0.018150)	
25	Feb 04, 1987	(0.006550)	(0.020150)		(0.005462)	(0.014640)	
26	Feb 05, 1987	0.016296	0.029086		0.017373	0.030245	
27	Feb 06, 1987	(0.006487)	(0.015943)		(0.007564)	(0.015605)	
28	Feb 09, 1987	(0.003803)	(0.019268)		(0.005438)	(0.020109)	
29	Feb 10, 1987	0.003261	0.003067		0.005980	0.007286	
30	Feb 11, 1987	(0.021943)	(0.030051)		(0.021365)	(0.035091)	
31	Feb 12, 1987	0.001109	0.008381		(0.004440)	0.009561	
32	Feb 13, 1987	(0.012263)	(0.009433)		(0.007257)	(0.009561)	
33	Feb 17, 1987	(0.002808)	0.005252		(0.003367)	0.000418	
34	Feb 18, 1987	(0.019308)	(0.020104)		(0.022166)	(0.014933)	
35	Feb 19, 1987	0.002291	(0.013559)		0.002296	(0.008726)	
36	Feb 20, 1987	0.019825	0.022073		0.018745	0.018637	
37	Feb 23, 1987	(0.038884)	(0.038458)		(0.039603)	(0.039154)	
38	Feb 24, 1987	(0.023600)	(0.020472)		(0.020705)	(0.018054)	
39	Feb 25, 1987	(0.019289)	(0.028042)		(0.019922)	(0.024970)	
40	Feb 26, 1987	0.032927	0.036995		0.022906	0.019177	
41	Feb 27, 1987	(0.031711)	(0.042792)		(0.010785)	(0.030402)	
42	Mar 02, 1987	(0.001217)	(0.006299)		(0.012731)	(0.002537)	
43	Mar 03, 1987	0.057361	0.071128		0.056921	0.066557	
44	Mar 04, 1987	-	(0.001090)		0.009180	0.003451	
45	Mar 05, 1987	0.033902	0.054148		0.013613	0.031163	
46	Mar 06, 1987	0.007196	0.020459		0.021183	0.026366	
47	Mar 09, 1987	-	(0.005076)		(0.004977)	(0.004278)	
48	Mar 10, 1987	0.007692	0.020150		0.004425	0.005700	
49	Mar 11, 1987	0.003279	0.000399		0.012613	0.019699	
50	Mar 12, 1987	0.004898	0.003583		0.002177	0.003180	
51	Mar 13, 1987	(0.001630)	0.005943		(0.001633)	0.000198	
52	Mar 16, 1987	0.011892	0.027276		0.015135	0.024301	
53	Mar 17, 1987	0.017577	0.017528		0.012264	0.008867	
54	Mar 18, 1987	(0.010082)	(0.058726)		(0.009585)	(0.034358)	
55	Mar 19, 1987	(0.007495)	0.020811		(0.004827)	0.004755	
56	Mar 20, 1987	0.004824	(0.019810)		0.003756	(0.016342)	
57	Mar 23, 1987	(0.005362)	(0.009044)		(0.021658)	(0.009285)	
58	Mar 24, 1987		0.008043		0.023798	0.023846	
59	Mar 25, 1987	(0.006473)	(0.015745)		(0.012910)	(0.022630)	
60	Mar 26, 1987	0.008084	(0.005509)		0.008625	(0.002434)	
61	Mar 27, 1987	0.001073	-		(0.000537)	(0.002643)	
62	Mar 30, 1987	0.001072	(0.002048)		0.003752	0.000611	
63	Mar 31, 1987	0.008002	(0.034411)		0.007463	0.011128	
64	Apr 01, 1987	(0.002128)	0.049669		(0.002659)	(0.005650)	
65	Apr 02, 1987	0.006369	0.007042		0.006898	0.006454	
66	Apr 03, 1987	(0.011708)	(0.010682)		(0.011167)	(0.007872)	
67	Apr 06, 1987	0.001605	(0.009569)		(0.001606)	(0.011412)	
68	Apr 07, 1987	(0.001070)	(0.002048)		0.009064	0.009181	
69	Apr 08, 1987	(0.000535)	(0.010303)		(0.010136)	(0.022385)	
70	Apr 09, 1987	(0.002144)	(0.009364)		(0.003222)	(0.008971)	
71	Apr 10, 1987	(0.020597)	(0.020062)		(0.026160)	(0.019895)	
72	Apr 13, 1987	(0.010460)	0.008496		(0.005537)	0.005330	
73	Apr 14, 1987	0.001106	(0.007004)		(0.001667)	(0.007684)	
74	Apr 15, 1987	0.020247	0.023159		0.026888	0.026849	
75	Apr 16, 1987	0.006480	(0.008779)		0.009162	(0.009431)	
76	Apr 20, 1987	0.004296	(0.013741)		0.000536	(0.013995)	
77	Apr 21, 1987	0.016477	0.012691		0.020171	0.018617	
78	Apr 22, 1987	0.003158	0.006285		(0.034210)	0.000629	
79	Apr 23, 1987	-	0.031860		0.010817	0.032560	
80	Apr 24, 1987	(0.001052)	0.006051		0.004830	0.005661	
81	Apr 27, 1987	(0.009514)	0.003012		0.007998	0.002618	
82	Apr 28, 1987	(0.005325)	(0.006638)		0.000531	0.002410	
83	Apr 29, 1987	(0.003744)	(0.022863)		(0.012821)	(0.026218)	
84	Apr 30, 1987	0.005345	0.019426		0.006965	0.019576	
85	May 01, 1987	0.004255	-		0.005325	(0.005670)	
86	May 04, 1987	0.004766	0.005050		0.004768	0.005064	
87	May 05, 1987	0.013120	0.012415		0.006848	0.005642	
88	May 06, 1987	0.002083	0.021265		0.009404	0.028327	
89	May 07, 1987	(0.007311)	(0.010773)		(0.005214)	(0.008434)	
90	May 08, 1987	0.010428	0.014662		0.006773	0.012138	
91	May 11, 1987	0.007750	0.003874		0.007758	0.012953	
92	May 12, 1987	(0.003093)	0.011532		(0.007239)	(0.007713)	
93	May 13, 1987	0.001032	(0.005365)		0.007239	0.003285	
94	May 14, 1987	0.008729	0.007274		0.007698	0.004236	
95	May 15, 1987	0.014213	(0.000954)		0.012195	(0.003079)	
96	May 18, 1987	0.003522	-		0.004535	0.000578	
97	May 19, 1987	0.003009	0.004761		(0.001006)	0.002116	
98	May 20, 1987	(0.011078)	(0.007629)		(0.043194)	(0.007911)	
99	May 21, 1987	0.010076	0.016520		0.010975	0.014616	
100	May 22, 1987	(0.013626)	(0.006992)		0.005701	(0.005744)	
101	May 25, 1987						
102	May 26, 1987	(0.016910)	(0.000949)		0.003611	(0.001537)	
103	May 27, 1987	0.001549	(0.012415)		(0.002578)	(0.006754)	
104	May 28, 1987	(0.005173)	(0.006750)		(0.005695)	(0.006410)	
105	May 29, 1987	0.004141	0.003862		0.006211	0.002530	
106	Jun 01, 1987	0.009766	-		0.009245	(0.008981)	

No	Tanggal	Cushing, OK WTI Spot Price FOB (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Spot Price FOB (Cents per Gallon)	Mont Belvieu, TX Propane Spot Price FOB (Cents per Gallon)	Cushing, OK Crude Oil Future Contract 1 (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Future Contract 1 (Cents per Gallon)	Mont Belvieu, Tx Propane Future Contract 1 (Cents per Gallon)
107	Jun 02, 1987	0.007643	(0.009295)		0.006624	0.007619	
108	Jun 03, 1987	0.008592	0.010258		0.008597	0.003303	
109	Jun 04, 1987	(0.006058)	(0.005794)		(0.002521)	(0.002525)	
110	Jun 05, 1987	0.002023	(0.002521)		(0.001010)	(0.000973)	
111	Jun 08, 1987	0.007551	0.014075		0.005543	0.012189	
112	Jun 09, 1987	(0.005028)	0.000957		(0.004028)	(0.002310)	
113	Jun 10, 1987	(0.000504)	0.002865		-	0.005191	
114	Jun 11, 1987	0.001008	(0.001909)		0.001512	(0.004228)	
115	Jun 12, 1987	0.004022	(0.001913)		0.003018	(0.001542)	
116	Jun 15, 1987	0.007000	0.007629		0.007506	0.010170	
117	Jun 16, 1987	0.009916	0.004739		0.010414	0.003240	
118	Jun 17, 1987	0.006883	0.005093		0.005903	0.002471	
119	Jun 18, 1987	0.004400	(0.005093)		0.006355	(0.002661)	
120	Jun 19, 1987	0.007290	-		0.006799	(0.000381)	
121	Jun 22, 1987	(0.007778)	(0.031310)		(0.008751)	(0.026236)	
122	Jun 23, 1987	(0.026708)	0.002533		(0.045451)	0.000977	
123	Jun 24, 1987	0.008982	(0.002924)		(0.008725)	(0.006858)	
124	Jun 25, 1987	0.000993	0.005839		0.012295	0.005881	
125	Jun 26, 1987	0.009385	0.027750		0.030093	0.027568	
126	Jun 29, 1987	0.001965	0.008458		0.005420	0.014723	
127	Jun 30, 1987	(0.007882)	0.008758		(0.002953)	0.007839	
128	Jul 01, 1987	0.012288	0.002409		0.009321	0.002228	
129	Jul 02, 1987	0.006816	0.001849		0.006328	(0.002228)	
130	Jul 03, 1987	-					
131	Jul 06, 1987	0.014929	0.005527		0.015407	0.008884	
132	Jul 07, 1987	(0.007678)	(0.017608)		(0.009119)	(0.007955)	
133	Jul 08, 1987	0.008633	0.007452		0.006728	0.005372	
134	Jul 09, 1987	0.017984	0.015653		0.016624	0.015399	
135	Jul 10, 1987	0.000938	0.005830		0.004699	0.006347	
136	Jul 13, 1987	0.001873	(0.004917)		0.003276	(0.005438)	
137	Jul 14, 1987	0.012550	0.011254		0.008376	0.006522	
138	Jul 15, 1987	0.026437	0.002344		0.026071	0.009882	
139	Jul 16, 1987	0.009402	0.007177		0.008541	(0.000537)	
140	Jul 17, 1987	-	0.006238		0.002236	0.013681	
141	Jul 20, 1987	(0.009402)	0.001775		(0.008522)	0.001411	
142	Jul 21, 1987	(0.021829)	(0.021514)		(0.022780)	(0.023715)	
143	Jul 22, 1987	(0.000920)	0.001811		(0.006936)	0.003962	
144	Jul 23, 1987	(0.023279)	(0.009999)		(0.014961)	(0.010116)	
145	Jul 24, 1987	(0.031096)	(0.026851)		(0.031582)	(0.035669)	
146	Jul 27, 1987	(0.003895)	(0.004326)		(0.003897)	0.001128	
147	Jul 28, 1987	0.040627	0.029348		0.039709	0.033269	
148	Jul 29, 1987	0.006536	(0.001832)		0.005613	(0.004372)	
149	Jul 30, 1987	(0.000931)	(0.000917)		(0.003738)	(0.003842)	
150	Jul 31, 1987	(0.001865)	(0.001837)		0.000468	0.001648	
151	Aug 03, 1987	0.035751	0.039659		0.036301	0.041224	
152	Aug 04, 1987	(0.017716)	(0.013344)		(0.008611)	(0.009705)	
153	Aug 05, 1987	(0.020839)	(0.012617)		(0.031440)	(0.016266)	
154	Aug 06, 1987	(0.009403)	(0.004545)		(0.007070)	(0.003792)	
155	Aug 07, 1987	(0.007587)	(0.006398)		(0.007121)	(0.006898)	
156	Aug 10, 1987	(0.014865)	(0.016642)		(0.012464)	(0.016344)	
157	Aug 11, 1987	0.017717	0.009280		0.012464	0.009948	
158	Aug 12, 1987	(0.005234)	(0.001479)		-	0.000550	
159	Aug 13, 1987	(0.009588)	(0.007801)		(0.010536)	(0.007540)	
160	Aug 14, 1987	(0.011141)	(0.011251)		(0.009676)	(0.010951)	
161	Aug 17, 1987	(0.033683)	(0.031609)		(0.036638)	(0.037267)	
162	Aug 18, 1987	(0.000504)	(0.006443)		0.003524	0.002129	
163	Aug 19, 1987	(0.000574)	(0.005303)		(0.013661)	(0.011275)	
164	Aug 20, 1987	(0.012251)	(0.017882)		(0.010756)	(0.016559)	
165	Aug 21, 1987	(0.013965)	(0.010075)		(0.027142)	(0.009386)	
166	Aug 24, 1987	(0.001042)	(0.010177)		(0.016000)	(0.016998)	
167	Aug 25, 1987	0.006237	(0.006774)		0.002148	0.001020	
168	Aug 26, 1987	0.009796	0.049231		0.043051	0.042509	
169	Aug 27, 1987	0.010209	0.009368		0.009207	0.010496	
170	Aug 28, 1987	(0.012778)	(0.011723)		(0.012811)	(0.008349)	
171	Aug 31, 1987	0.016327	0.019463		0.017383	0.015861	
172	Sep 01, 1987	(0.007620)	0.001926		(0.005081)	0.002300	
173	Sep 02, 1987	0.000510	(0.001926)		0.000509	0.003440	
174	Sep 03, 1987	(0.007161)	0.003271		(0.007154)	(0.004015)	
175	Sep 04, 1987	(0.007213)	(0.011011)		(0.009274)	(0.007113)	
176	Sep 07, 1987	-					
177	Sep 08, 1987	(0.018263)	(0.014676)		(0.019865)	(0.019089)	
178	Sep 09, 1987	0.022906	0.025687		0.022966	0.028307	
179	Sep 10, 1987	0.014815	0.007274		0.014853	0.011594	
180	Sep 11, 1987	(0.015330)	(0.007658)		(0.013822)	(0.009684)	
181	Sep 14, 1987	0.011265	0.009564		0.010767	0.010628	
182	Sep 15, 1987	0.001018	(0.012451)		0.004579	(0.007010)	
183	Sep 16, 1987	0.002540	-		0.001522	(0.005720)	
184	Sep 17, 1987	(0.006617)	(0.006769)		(0.008654)	(0.007485)	
185	Sep 18, 1987	-	0.002907		(0.000511)	0.003270	
186	Sep 21, 1987	0.009657	0.003862		0.009165	0.003642	
187	Sep 22, 1987	(0.021473)	-		(0.024629)	(0.003642)	
188	Sep 23, 1987	0.015894	0.017199		0.022092	0.021841	
189	Sep 24, 1987	(0.002546)	0.006609		(0.001526)	0.004686	
190	Sep 25, 1987	(0.007165)	(0.002827)		(0.009716)	(0.002059)	
191	Sep 28, 1987	0.000513	-		(0.000514)	0.000562	
192	Sep 29, 1987	0.005120	0.014057		0.004617	0.013947	
193	Sep 30, 1987	0.002041	0.004086		0.002556	(0.000554)	
194	Oct 01, 1987	-	0.007939		0.001530	0.012851	
195	Oct 02, 1987	0.013165	0.015510		0.012158	0.013408	
196	Oct 05, 1987	(0.003527)	0.005417		(0.002016)	0.006637	
197	Oct 06, 1987	(0.024529)	(0.015425)		(0.019359)	(0.020046)	
198	Oct 07, 1987	0.017945	0.012721		0.011253	0.016643	
199	Oct 08, 1987	0.004563	0.008093		(0.003567)	-	
200	Oct 09, 1987	(0.005071)	(0.005388)		0.005599	0.001792	
201	Oct 12, 1987	-	-		(0.002541)	(0.000717)	
202	Oct 13, 1987	(0.000509)	0.003595		0.002541	(0.001794)	
203	Oct 14, 1987	0.006591	0.002688		0.003547	0.005907	
204	Oct 15, 1987	(0.001011)	-		(0.001012)	0.000892	
205	Oct 16, 1987	0.023001	0.027708		0.023519	0.027784	
206	Oct 19, 1987	(0.021990)	(0.021465)		(0.020990)	(0.017672)	
207	Oct 20, 1987	-	0.008853		0.003529	(0.005665)	
208	Oct 21, 1987	0.007049	0.002641		0.009018	0.013927	
209	Oct 22, 1987	0.012961	0.013099		0.007453	0.009583	
210	Oct 23, 1987	(0.000495)	(0.006092)		(0.001982)	(0.003474)	
211	Oct 26, 1987	(0.008960)	(0.010530)		(0.008468)	(0.010143)	
212	Oct 27, 1987	0.007472	0.010006		0.006482	0.008228	
213	Oct 28, 1987	(0.002484)	0.004879		(0.001990)	0.004870	
214	Oct 29, 1987	(0.008494)	(0.006627)		(0.005493)	(0.006265)	

No	Tanggal	Cushing, OK WTI Spot Price FOB (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Spot Price FOB (Cents per Gallon)	Mont Belvieu, TX Propane Spot Price FOB (Cents per Gallon)	Cushing, OK Crude Oil Future Contract 1 (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Future Contract 1 (Cents per Gallon)	Mont Belvieu, Tx Propane Future Contract 1 (Cents per Gallon)
215	Oct 30, 1987	0.001504	0.003145		(0.000501)	0.003138	
216	Nov 02, 1987	(0.016162)	(0.014937)		(0.017181)	(0.015610)	
217	Nov 03, 1987	(0.012811)	(0.005860)		(0.006648)	(0.006384)	
218	Nov 04, 1987	(0.015593)	(0.018333)		(0.021785)	(0.017588)	
219	Nov 05, 1987	(0.003674)	0.002717		(0.004731)	0.001086	
220	Nov 06, 1987	(0.015365)	0.004512		(0.009529)	0.001265	
221	Nov 09, 1987	(0.003744)	(0.006867)		(0.009084)	(0.009620)	
222	Nov 10, 1987	0.017004	0.021171		0.016503	0.018432	
223	Nov 11, 1987	(0.003166)	0.012350		(0.002114)	0.020908	
224	Nov 12, 1987	0.000528	(0.001404)		0.000529	(0.003865)	
225	Nov 13, 1987	(0.002115)	(0.011834)		0.001057	(0.011330)	
226	Nov 16, 1987	(0.010644)	(0.004988)		(0.014902)	(0.005892)	
227	Nov 17, 1987	(0.022181)	(0.020203)		(0.013495)	(0.011528)	
228	Nov 18, 1987	0.018429	0.003093		0.012959	(0.004721)	
229	Nov 19, 1987	(0.003766)	-		(0.003762)	-	
230	Nov 20, 1987	0.017104	0.012277		0.019201	0.009601	
231	Nov 23, 1987	0.023050	0.007152		(0.007955)	0.004856	
232	Nov 24, 1987	(0.030497)	(0.004464)		(0.003734)	(0.005036)	
233	Nov 25, 1987	(0.005353)	0.008908		(0.004822)	0.009154	
234	Nov 26, 1987						
235	Nov 27, 1987	-	-				
236	Nov 30, 1987	(0.005922)	-		(0.005925)	(0.000894)	
237	Dec 01, 1987	(0.004329)	(0.006763)		(0.002705)	(0.019138)	
238	Dec 02, 1987	0.008102	0.013832		0.005402	0.014657	
239	Dec 03, 1987	0.014950	0.021776		0.016565	0.017804	
240	Dec 04, 1987	(0.010120)	(0.009523)		(0.006913)	(0.007261)	
241	Dec 07, 1987	(0.020552)	(0.023767)		(0.026495)	(0.023924)	
242	Dec 08, 1987	(0.013202)	(0.022521)		(0.009359)	(0.015780)	
243	Dec 09, 1987	0.025691	0.018058		0.025663	0.013776	
244	Dec 10, 1987	(0.001080)	0.004820		(0.002159)	0.003823	
245	Dec 11, 1987	(0.010864)	(0.002139)		(0.010864)	(0.001819)	
246	Dec 14, 1987	(0.046962)	(0.030811)		(0.048681)	(0.028998)	
247	Dec 15, 1987	(0.042087)	(0.040377)		(0.047558)	(0.045236)	
248	Dec 16, 1987	(0.047686)	(0.035105)		(0.041123)	(0.034510)	
249	Dec 17, 1987	-	0.004950		(0.007547)	0.006877	
250	Dec 18, 1987	(0.025366)	(0.014924)		(0.016550)	(0.017898)	
251	Dec 21, 1987	(0.029328)	0.009974		(0.027328)	0.012643	
252	Dec 22, 1987	0.093384	0.049754		0.091345	0.051729	
253	Dec 23, 1987	0.002407	(0.014266)		0.001805	(0.008114)	
254	Dec 24, 1987	(0.006028)	(0.000958)		(0.007238)	(0.005837)	
255	Dec 28, 1987	(0.004848)	(0.014875)		(0.006072)	(0.002344)	
256	Dec 29, 1987	0.029335	0.009106		0.030587	0.014755	
257	Dec 30, 1987	0.001179	(0.014570)		(0.002365)	(0.013777)	
258	Dec 31, 1987	(0.013646)	0.004491		(0.011313)	0.005067	
1804	Jan 03, 1994	0.022990	0.021227	(0.009998)	0.027151	0.023499	(0.004016)
1805	Jan 04, 1994	0.009596	0.018618	-	0.007527	0.017975	0.010010
1806	Jan 05, 1994	0.042730	0.036228	0.029699	0.044659	0.039405	0.042892
1807	Jan 06, 1994	0.003914	0.005219	-	0.005202	(0.004815)	(0.011516)
1808	Jan 07, 1994	(0.001955)	0.010356	0.009707	(0.006506)	0.010854	0.003854
1809	Jan 10, 1994	(0.045371)	(0.026095)	-	(0.043355)	(0.029708)	(0.009662)
1810	Jan 11, 1994	0.020271	0.044470	-	0.012195	0.034885	-
1811	Jan 12, 1994	(0.040265)	(0.005070)	0.004626	(0.035645)	(0.007255)	(0.009756)
1812	Jan 13, 1994	0.013831	0.014133	(0.004626)	0.012483	0.017324	0.011696
1813	Jan 14, 1994	0.017025	0.046037	0.014196	0.018437	0.046929	0.022990
1814	Jan 17, 1994	0.022698	0.026452	0.028171	0.021420	0.027135	0.026170
1815	Jan 18, 1994	(0.015298)	(0.072488)	(0.013798)	(0.015349)	(0.062275)	(0.020504)
1816	Jan 19, 1994	0.021877	0.015911	0.004496	0.023265	0.011851	(0.001885)
1817	Jan 20, 1994	(0.019868)	(0.052665)	0.004848	(0.007916)	(0.043254)	-
1818	Jan 21, 1994	(0.006711)	0.004151	(0.028298)	(0.010653)	0.001458	(0.011385)
1819	Jan 24, 1994	0.016032	0.030596	(0.009614)	0.015278	0.027922	(0.003824)
1820	Jan 25, 1994	0.011203	0.022839	0.019136	-	0.010273	0.011429
1821	Jan 26, 1994	0.015605	0.038518	0.018776	0.019583	0.047167	0.026170
1822	Jan 27, 1994	(0.001291)	0.014070	0.018430	(0.003237)	0.014236	0.023702
1823	Jan 28, 1994	(0.007131)	(0.009358)	-	(0.005202)	(0.006808)	-
1824	Jan 31, 1994	(0.008494)	0.018629	0.044642	(0.009826)	0.018798	0.030171
1825	Feb 01, 1994	0.043024	0.047753	0.042734	0.046939	(0.035444)	0.013544
1826	Feb 02, 1994	0.009384	0.043388	0.056917	0.007509	0.033207	0.054049
1827	Feb 03, 1994	(0.005620)	0.022162	(0.007935)	(0.009396)	(0.024179)	(0.036610)
1828	Feb 04, 1994	(0.021520)	(0.031472)	(0.053342)	(0.016498)	(0.023995)	(0.025752)
1829	Feb 07, 1994	(0.020686)	(0.009398)	(0.004042)	(0.024613)	(0.021378)	(0.017544)
1830	Feb 08, 1994	(0.012488)	0.042846	-	(0.002626)	0.011736	0.007055
1831	Feb 09, 1994	(0.032261)	0.001643	(0.017019)	(0.040932)	(0.023408)	(0.024912)
1832	Feb 10, 1994	(0.003421)	0.010617	-	(0.002743)	0.018253	(0.003610)
1833	Feb 11, 1994	0.008191	0.019309	-	0.010929	0.013230	0.012579
1834	Feb 14, 1994	(0.038813)	(0.090858)	(0.030675)	(0.040907)	(0.063989)	(0.027151)
1835	Feb 15, 1994	(0.001414)	(0.069928)	(0.013184)	(0.004966)	(0.016233)	-
1836	Feb 16, 1994	(0.017131)	(0.046547)	(0.009007)	(0.009289)	(0.044104)	(0.005520)
1837	Feb 17, 1994	0.026289	(0.050262)	(0.009089)	0.021308	0.004875	(0.009268)
1838	Feb 18, 1994	(0.003512)	0.004731	-	(0.001406)	0.011210	0.014788
1839	Feb 21, 1994						
1840	Feb 22, 1994	0.004914	0.027726	0.018097	0.002109	0.023332	0.019982
1841	Feb 23, 1994	(0.007027)	0.006565	0.017775	0.011868	0.008294	0.024868
1842	Feb 24, 1994	0.044145	0.049328	0.026084	0.024676	0.034142	0.007341
1843	Feb 25, 1994	(0.023209)	0.015916	0.008546	(0.013633)	0.016643	(0.000348)
1844	Feb 28, 1994	0.001380	(0.043279)	(0.025859)	(0.006196)	0.012005	(0.006993)
1845	Mar 01, 1994	0.019126	0.026796	(0.026546)	0.013036	(0.098797)	(0.030278)
1846	Mar 02, 1994	0.001352	(0.013308)	0.017775	0.006116	0.004163	0.009001
1847	Mar 03, 1994	(0.004062)	(0.007107)	(0.008848)	(0.000678)	(0.001751)	(0.010811)
1848	Mar 04, 1994	(0.011600)	(0.011633)	(0.004632)	(0.012278)	(0.017008)	(0.007273)
1849	Mar 07, 1994	(0.029957)	(0.023280)	-	(0.032790)	(0.034447)	(0.005489)
1850	Mar 08, 1994	0.002119	(0.005404)	(0.004295)	-	(0.000461)	(0.001837)
1851	Mar 09, 1994	0.004225	(0.003015)	-	0.005658	0.010099	0.005500
1852	Mar 10, 1994	(0.002815)	(0.015212)	-	(0.002825)	(0.011715)	-
1853	Mar 11, 1994	0.019540	(0.007179)	0.021995	0.020994	0.009657	0.019910
1854	Mar 14, 1994	0.003449	(0.028183)	0.004551	0.003457	(0.007811)	(0.005391)
1855	Mar 15, 1994	0.020451	0.009483	0.008694	0.023193	0.028869	0.007181
1856	Mar 16, 1994	0.014071	0.001048	-	0.015390	(0.003591)	0.003571
1857	Mar 17, 1994	(0.013396)	0.004181	-	(0.016065)	(0.005185)	0.001781
1858	Mar 18, 1994	0.003366	0.003125	-	0.004040	0.005185	0.001778
1859	Mar 21, 1994	0.032400	0.023637	0.008619	0.032400	0.013846	0.005314
1860	Mar 22, 1994	(0.021704)	(0.012263)	-	(0.011122)	0.002437	0.007042
1861	Mar 23, 1994	(0.006671)	0.005128	-	(0.019934)	(0.003990)	(0.010582)
1862	Mar 24, 1994	0.017911	0.001022	(0.017313)	0.012008	0.004211	(0.001775)
1863	Mar 25, 1994	(0.001316)	0.025226	-	0.003310	0.023392	0.003546
1864	Mar 28, 1994	(0.070923)	(0.057416)	(0.031219)	(0.071924)	(0.055990)	(0.041560)
1865	Mar 29, 1994	0.018208	0.007360	0.013601	0.016902	0.019014	0.029093
1866	Mar 30, 1994	(0.000694)	0.024831	(0.008927)	0.004181	0.009817	(0.003591)
1867	Mar 31, 1994	0.026047	(0.010271)	0.008927	0.028113	0.016733	0.007168

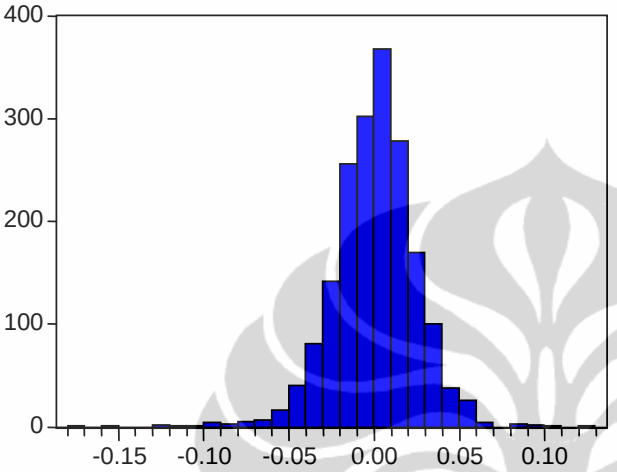
No	Tanggal	Cushing, OK WTI Spot Price FOB (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Spot Price FOB (Cents per Gallon)	Mont Belvieu, TX Propane Spot Price FOB (Cents per Gallon)	Cushing, OK Crude Oil Future Contract 1 (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Future Contract 1 (Cents per Gallon)	Mont Belvieu, Tx Propane Future Contract 1 (Cents per Gallon)
1868	Apr 04, 1994	0.058473	0.042448	0.017618	0.065426	0.008046	0.017700
1869	Apr 05, 1994	-	(0.016562)	(0.008770)	(0.003172)	(0.007610)	-
1870	Apr 06, 1994	0.006361	(0.016637)	0.017465	0.001904	(0.006789)	0.008734
1871	Apr 07, 1994	(0.011480)	(0.024856)	(0.008694)	(0.012121)	(0.015501)	-
1872	Apr 08, 1994	(0.001284)	(0.015855)	(0.004551)	(0.000642)	0.005564	(0.008734)
1873	Apr 11, 1994	0.018454	0.010598	(0.004219)	0.019085	0.016726	(0.001756)
1874	Apr 12, 1994	(0.007595)	(0.009533)	-	(0.007590)	(0.007448)	-
1875	Apr 13, 1994	0.013880	0.002126	-	0.013872	0.007448	-
1876	Apr 14, 1994	0.014926	0.017893	0.008770	0.016149	0.019023	0.001756
1877	Apr 15, 1994	0.023186	0.014499	-	0.021336	0.014878	0.017392
1878	Apr 18, 1994	0.003612	(0.007223)	-	0.004213	(0.007837)	-
1879	Apr 19, 1994	(0.012701)	(0.023047)	-	(0.009656)	(0.018455)	(0.006920)
1880	Apr 20, 1994	0.013301	0.002117	-	0.019815	0.004969	(0.003478)
1881	Apr 21, 1994	0.053213	0.004221	0.012841	(0.011360)	0.010078	0.013841
1882	Apr 22, 1994	0.015820	0.015673	0.021492	0.030207	0.021111	0.020409
1883	Apr 25, 1994	(0.010141)	0.008259	(0.008473)	0.005817	0.007492	-
1884	Apr 26, 1994	(0.048734)	(0.023932)	0.016875	(0.019327)	(0.017992)	0.006711
1885	Apr 27, 1994	(0.007160)	0.001053	(0.016875)			
1886	Apr 28, 1994	(0.007815)	(0.021264)	0.004076	(0.020311)	(0.018107)	(0.008396)
1887	Apr 29, 1994	0.020903	0.012812	(0.004076)	0.019720	0.011329	(0.003040)
1888	May 02, 1994	0.015250	0.010553	(0.004435)	0.015267	0.010991	0.003040
1889	May 03, 1994	(0.014659)	(0.011615)	0.004435	(0.015859)	(0.014398)	(0.005072)
1890	May 04, 1994	(0.004737)	(0.006393)	0.008473	(0.001778)	(0.004917)	0.008439
1891	May 05, 1994	0.025199	0.013799	0.008402	0.025184	0.013834	0.008368
1892	May 06, 1994	0.026272	0.016726	0.008332	0.023436	0.016560	0.016529
1893	May 09, 1994	(0.001128)	0.007231	0.008263	0.001693	0.004977	-
1894	May 10, 1994	(0.005659)	(0.014514)	0.008195	(0.006791)	(0.010815)	0.001965
1895	May 11, 1994	0.012409	0.005208	-	0.013537	0.000627	0.004571
1896	May 12, 1994	0.023817	0.006214	(0.016459)	0.023804	0.007703	(0.008177)
1897	May 13, 1994	(0.003839)	0.001032	-	(0.003837)	0.005171	(0.004938)
1898	May 16, 1994	(0.011606)	(0.013498)	(0.016734)	(0.008271)	(0.013710)	(0.018319)
1899	May 17, 1994	(0.021349)	(0.016867)	(0.008473)	(0.026369)	(0.016237)	(0.008439)
1900	May 18, 1994	0.023015	0.009523	-	0.022485	0.013933	-
1901	May 19, 1994	0.025748	0.003154	0.008473	0.025248	0.003349	-
1902	May 20, 1994	0.023518	0.008363	-	0.025155	0.009565	0.005072
1903	May 23, 1994	(0.012759)	(0.007314)	-	(0.046520)	(0.008521)	(0.005072)
1904	May 24, 1994	(0.015638)	(0.002100)	(0.008473)	(0.007782)	(0.006491)	(0.005098)
1905	May 25, 1994	(0.031468)	(0.001051)	(0.008546)	(0.012353)	0.000630	(0.011997)
1906	May 26, 1994	(0.003934)	0.003151	(0.017313)	0.002257	0.003981	(0.008658)
1907	May 27, 1994	0.014534	0.012505	0.008694	0.016215	0.011643	0.001738
1908	May 31, 1994	0.015419	0.026570	(0.008694)	0.015410	0.027120	(0.005920)
1909	Jun 01, 1994	(0.000547)	(0.010136)	-	(0.005476)	(0.005649)	0.005920
1910	Jun 02, 1994	(0.002189)	(0.014365)	0.017313	0.001098	(0.018994)	0.012080
1911	Jun 03, 1994	(0.007701)	(0.004143)	(0.004473)	(0.006052)	(0.005790)	(0.005159)
1912	Jun 06, 1994	(0.000552)	(0.012531)	(0.004147)	(0.000552)	(0.013782)	-
1913	Jun 07, 1994	(0.017838)	(0.026623)	(0.008694)	(0.020079)	(0.023185)	(0.008658)
1914	Jun 08, 1994	0.027733	0.008597	-	0.032699	0.003223	-
1915	Jun 09, 1994	0.021110	0.008523	-	0.017833	0.007905	0.005204
1916	Jun 10, 1994	(0.010229)	(0.002124)	-	(0.010229)	(0.001704)	(0.008688)
1917	Jun 13, 1994	0.018231	0.015821	(0.008770)	0.016636	0.015442	(0.005249)
1918	Jun 14, 1994	0.006356	0.009374	-	0.008479	0.006069	-
1919	Jun 15, 1994	0.041877	0.050536	0.008770	0.046904	0.053815	0.008734
1920	Jun 16, 1994	0.004042	(0.002961)	0.008694	0.002514	(0.001187)	0.008658
1921	Jun 17, 1994	0.043903	0.029225	0.008619	0.039395	0.029259	0.011997
1922	Jun 20, 1994	(0.001932)	(0.010617)	-	0.001930	(0.010629)	-
1923	Jun 21, 1994	(0.029443)	(0.019597)	0.008546	(0.034816)	(0.019818)	0.005098
1924	Jun 22, 1994	(0.024705)	(0.010944)	-	(0.034005)	(0.012564)	0.003384
1925	Jun 23, 1994	(0.010778)	0.016864	(0.008546)	0.002578	0.016914	(0.006780)
1926	Jun 24, 1994	(0.005173)	(0.005920)	-	(0.005163)	(0.005739)	(0.010257)
1927	Jun 27, 1994	(0.016737)	(0.016965)	(0.026084)	(0.016176)	(0.017012)	(0.006897)
1928	Jun 28, 1994	0.009449	0.007020	0.004219	0.013584	0.008242	(0.006944)
1929	Jun 29, 1994	(0.016860)	(0.006014)	0.004551	(0.023098)	(0.007435)	(0.001744)
1930	Jun 30, 1994	0.028805	0.017936	-	0.028274	0.020166	0.001744
1931	Jul 01, 1994	0.007714	0.001973	0.008694	0.008226	0.003749	0.003478
1932	Jul 04, 1994						
1933	Jul 05, 1994	0.005110	(0.010901)	-	0.004598	(0.009100)	-
1934	Jul 06, 1994	(0.016444)	(0.024204)	-	(0.019558)	(0.024747)	0.010363
1935	Jul 07, 1994	(0.007802)	(0.019586)	-	(0.006257)	(0.018711)	0.001717
1936	Jul 08, 1994	0.017086	0.012415	-	0.018653	0.012581	0.003425
1937	Jul 11, 1994	0.034808	0.014292	0.008619	0.035304	0.018480	0.011895
1938	Jul 12, 1994	0.011339	0.011088	0.008546	0.012312	0.014780	-
1939	Jul 13, 1994	(0.012827)	(0.001003)	-	(0.013800)	(0.004570)	(0.003384)
1940	Jul 14, 1994	0.001984	0.006002	-	0.001488	0.005561	0.008439
1941	Jul 15, 1994	(0.014475)	(0.016087)	(0.008546)	(0.014475)	(0.013359)	(0.011834)
1942	Jul 18, 1994	(0.025975)	(0.018413)	(0.004473)	(0.019290)	(0.019867)	(0.001702)
1943	Jul 19, 1994	0.005660	0.015368	(0.004147)	(0.002566)	0.013019	(0.003413)
1944	Jul 20, 1994	(0.017599)	0.005070	0.008619	(0.013451)	0.003027	0.003413
1945	Jul 21, 1994	0.008838	0.007056	-	0.009847	0.006227	-
1946	Jul 22, 1994	0.013878	0.012973	-	0.011282	0.012536	0.006791
1947	Jul 25, 1994	(0.008716)	(0.007963)	0.008546	(0.010251)	(0.007941)	0.006745
1948	Jul 26, 1994	(0.008273)	0.001997	-	(0.010357)	(0.003594)	-
1949	Jul 27, 1994	0.010331	0.004975	0.016875	0.012930	0.007970	0.008368
1950	Jul 28, 1994	0.020850	0.013799	(0.004360)	0.015805	0.005936	-
1951	Jul 29, 1994	0.021410	0.040289	0.012692	0.026455	0.042675	0.009950
1952	Aug 01, 1994	0.017094	0.017706	0.016459	0.012240	0.025384	0.022839
1953	Aug 02, 1994	(0.021043)	(0.019588)	(0.008195)	(0.020153)	(0.023118)	(0.016261)
1954	Aug 03, 1994	(0.007944)	(0.013275)	-	(0.001988)	(0.007953)	0.008163
1955	Aug 04, 1994	0.003980	(0.010556)	-	0.001988	(0.010511)	-
1956	Aug 05, 1994	(0.038982)	(0.059624)	(0.004288)	(0.042085)	(0.056718)	(0.008163)
1957	Aug 08, 1994	0.002063	0.013224	0.004288	0.005680	0.013531	0.006536
1958	Aug 09, 1994	(0.006202)	0.004034	-	(0.006198)	0.006399	-
1959	Aug 10, 1994	(0.017255)	0.002011	-	(0.017774)	(0.000598)	-
1960	Aug 11, 1994	(0.015414)	(0.009081)	(0.004288)	(0.015949)	(0.008412)	(0.001630)
1961	Aug 12, 1994	(0.033772)	(0.023588)	(0.003975)	(0.033237)	(0.023401)	(0.014791)
1962	Aug 15, 1994	0.010471	0.011351	(0.004324)	0.008276	0.010853	0.004955
1963	Aug 16, 1994	(0.033448)	(0.010314)	0.004324	(0.026163)	(0.011471)	0.001646
1964	Aug 17, 1994	0.024637	0.028614	-	0.021206	0.025024	(0.011580)
1965	Aug 18, 1994	(0.019548)	(0.021384)	-	(0.021770)	(0.021733)	0.006634
1966	Aug 19, 1994	(0.009635)	(0.013470)	(0.008332)	(0.007932)	(0.013853)	(0.003311)
1967	Aug 22, 1994	(0.040087)	(0.015772)	(0.008402)	(0.041225)	(0.015316)	(0.011677)
1968	Aug 23, 1994	0.012957	0.010542	(0.004397)	0.012957	0.010725	(0.001679)
1969	Aug 24, 1994	0.025990	0.018700	0.004397	0.023136	0.015359	-
1970	Aug 25, 1994	(0.002855)	0.008200	-	0.001714	0.004521	(0.003367)
1971	Aug 26, 1994	(0.020214)	(0.013360)	(0.008473)	(0.021928)	(0.012171)	(0.013583)
1972	Aug 29, 1994	0.027620	0.018451	(0.008546)	0.028187	0.013606	-
1973	Aug 30, 1994	(0.012564)	(0.008158)	-	(0.010262)	(0.005955)	0.015267
1974	Aug 31, 1994	0.011429	0.009173	0.008546	0.006284	0.017154	0.000337
1975	Sep 01, 1994	(0.007414)	(0.002031)	0.008473	(0.005138)	(0.002230)	0.004701

No	Tanggal	Cushing, OK WTI Spot Price FOB (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Spot Price FOB (Cents per Gallon)	Mont Belvieu, TX Propane Spot Price FOB (Cents per Gallon)	Cushing, OK Crude Oil Future Contract 1 (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Future Contract 1 (Cents per Gallon)	Mont Belvieu, Tx Propane Future Contract 1 (Cents per Gallon)
1976	Sep 02, 1994	0.002858	0.008100	-	0.002858	0.008889	-
1977	Sep 05, 1994						
1978	Sep 06, 1994	0.005692	-	(0.004397)	0.005692	0.004615	-
1979	Sep 07, 1994	0.012409	(0.003030)	0.012799	0.010725	0.002400	0.006678
1980	Sep 08, 1994	(0.012409)	(0.011189)	-	(0.007892)	(0.008827)	0.003322
1981	Sep 09, 1994	(0.005121)	(0.006156)	-	(0.007955)	(0.005253)	0.011542
1982	Sep 12, 1994	(0.008018)	(0.007231)	-	(0.008018)	(0.006095)	0.003273
1983	Sep 13, 1994	(0.022682)	(0.026259)	-	(0.015648)	(0.019550)	(0.003601)
1984	Sep 14, 1994	(0.016608)	(0.022603)	(0.008402)	(0.024240)	(0.022912)	(0.016201)
1985	Sep 15, 1994	-	(0.007649)	-	(0.000599)	(0.006827)	0.006645
1986	Sep 16, 1994	0.007151	0.006560	0.008402	0.007754	0.006402	0.001654
1987	Sep 19, 1994	0.021734	0.031115	-	0.022328	0.027485	-
1988	Sep 20, 1994	0.001742	(0.008487)	-	0.001742	0.000621	(0.001654)
1989	Sep 21, 1994	(0.010496)	(0.008560)	-	(0.001161)	(0.014584)	0.001654
1990	Sep 22, 1994	0.033999	0.019158	(0.008402)	0.025797	0.018506	-
1991	Sep 23, 1994	0.006213	-	0.008402	0.009014	0.000206	(0.001654)
1992	Sep 26, 1994	(0.004515)	(0.015939)	-	(0.009014)	(0.015987)	0.001654
1993	Sep 27, 1994	(0.011377)	-	0.008332	(0.006814)	(0.002515)	0.001652
1994	Sep 28, 1994	0.011942	0.016993	0.008263	0.007380	0.013960	0.004938
1995	Sep 29, 1994	0.015148	0.024960	0.008195	0.016826	0.020277	0.009804
1996	Sep 30, 1994	0.022027	0.019327	0.008129	0.022547	0.018084	0.008097
1997	Oct 03, 1994	(0.010953)	(0.015227)	0.008063	(0.010935)	0.000398	0.016000
1998	Oct 04, 1994	(0.010518)	(0.015463)	0.015934	(0.006066)	(0.009801)	0.015748
1999	Oct 05, 1994	0.002223	0.009306	0.007873	(0.003879)	0.004012	-
2000	Oct 06, 1994	0.012690	0.006156	0.015562	0.013238	0.005789	0.023167
2001	Oct 07, 1994	0.001643	0.002044	0.015324	0.000548	0.003775	0.010630
2002	Oct 10, 1994	(0.017670)	(0.013360)	0.007575	(0.014897)	(0.016797)	(0.007582)
2003	Oct 11, 1994	(0.011768)	(0.019852)	(0.022898)	(0.016251)	(0.017494)	(0.007639)
2004	Oct 12, 1994	(0.034991)	(0.035446)	(0.004023)	(0.029237)	(0.041267)	(0.003072)
2005	Oct 13, 1994	(0.005855)	0.013035	0.011714	(0.003497)	0.001923	(0.007722)
2006	Oct 14, 1994	(0.002940)	(0.003243)	(0.023253)	(0.009384)	(0.002993)	-
2007	Oct 17, 1994	0.007627	0.010769	0.007811	0.005289	0.009376	0.003096
2008	Oct 18, 1994	0.013353	0.015939	0.007751	0.009335	0.004866	0.012289
2009	Oct 19, 1994	0.005177	0.007352	-	0.011547	0.017366	-
2010	Oct 20, 1994	0.008000	0.038391	0.007691	0.006865	0.037256	0.001526
2011	Oct 21, 1994	(0.014909)	(0.021786)	-	(0.009164)	(0.031465)	0.006079
2012	Oct 24, 1994	0.010917	0.011258	(0.007691)	0.004020	0.013723	(0.003035)
2013	Oct 25, 1994	0.011929	0.001017	(0.007751)	0.007422	0.002844	(0.010695)
2014	Oct 26, 1994	0.016798	0.001016	0.015442	0.020828	0.003644	0.012214
2015	Oct 27, 1994	0.008845	(0.003052)	0.007632	0.011080	(0.001618)	0.007559
2016	Oct 28, 1994	0.004393	(0.002040)	0.003643	0.004398	(0.001824)	-
2017	Oct 31, 1994	(0.004944)	(0.006144)	0.003932	(0.002197)	(0.006715)	-
2018	Nov 01, 1994	0.027161	0.031344	0.003616	0.026581	0.034908	0.014948
2019	Nov 02, 1994	0.012780	0.004965	0.014926	0.013295	0.009419	0.008863
2020	Nov 03, 1994	0.003697	0.007893	0.011196	(0.001586)	0.004288	0.011696
2021	Nov 04, 1994	(0.011132)	(0.007893)	0.007298	(0.007435)	(0.008202)	0.007241
2022	Nov 07, 1994	(0.020464)	(0.009954)	0.007245	(0.019920)	(0.011041)	(0.011611)
2023	Nov 08, 1994	0.004343	0.006978	(0.033175)	0.010279	0.012609	(0.006444)
2024	Nov 09, 1994	(0.016385)	(0.002985)	(0.003589)	(0.022864)	(0.010035)	(0.008262)
2025	Nov 10, 1994	0.001101	0.006951	-	0.001651	0.004538	0.019076
2026	Nov 11, 1994	(0.006069)	(0.010944)	0.029518	(0.008280)	(0.009096)	0.005797
2027	Nov 14, 1994	(0.033196)	(0.030472)	-	(0.032106)	(0.030046)	-
2028	Nov 15, 1994	0.005705	(0.002065)	0.007245	0.006277	(0.005131)	0.005764
2029	Nov 16, 1994	(0.011442)	(0.019832)	0.003459	(0.012017)	(0.017435)	(0.005764)
2030	Nov 17, 1994	0.014282	0.009443	(0.014493)	0.015991	0.007925	-
2031	Nov 18, 1994	(0.009117)	(0.003138)	0.014493	(0.010251)	(0.001247)	0.018612
2032	Nov 21, 1994	(0.002292)	0.009384	0.014286	0.005138	0.009934	-
2033	Nov 22, 1994	0.015372	0.012376	(0.003410)	0.014698	0.012077	0.002833
2034	Nov 23, 1994	0.019581	0.032274	-	0.018349	0.034397	0.003953
2035	Nov 24, 1994						
2036	Nov 25, 1994						
2037	Nov 28, 1994	0.002766	-	0.021125	(0.001654)	(0.005717)	0.007299
2038	Nov 29, 1994	(0.007208)	(0.021062)	(0.017715)	(0.003871)	(0.012133)	(0.009838)
2039	Nov 30, 1994	0.004996	(0.014292)	(0.017745)	-	(0.020419)	(0.011364)
2040	Dec 01, 1994	(0.016188)	(0.013456)	(0.007245)	(0.012824)	(0.004298)	(0.017291)
2041	Dec 02, 1994	(0.044298)	(0.043666)	(0.044610)	(0.047696)	(0.036132)	(0.044584)
2042	Dec 05, 1994	(0.007084)	0.002175	(0.015324)	(0.008274)	(0.000213)	(0.004570)
2043	Dec 06, 1994	0.002958	0.008652	0.015324	0.005327	0.005939	0.021149
2044	Dec 07, 1994	(0.004143)	0.010711	-	(0.004141)	0.008003	0.006258
2045	Dec 08, 1994	0.016471	0.035583	0.018681	0.014710	0.029760	0.017668
2046	Dec 09, 1994	(0.001168)	0.010229	0.018631	0.000584	0.003253	0.002624
2047	Dec 12, 1994	(0.011751)	(0.005102)	0.014544	(0.012926)	(0.008561)	0.011578
2048	Dec 13, 1994	0.003540	0.008150	(0.014544)	-	(0.007603)	(0.007220)
2049	Dec 14, 1994	(0.001179)	0.006069	0.007298	0.004720	0.021629	(0.001450)
2050	Dec 15, 1994	(0.021455)	(0.016267)	-	(0.015421)	(0.015460)	0.007231
2051	Dec 16, 1994	0.014354	(0.009268)	(0.018495)	0.001792	(0.006582)	(0.013053)
2052	Dec 19, 1994	0.004148	(0.014590)	0.003844	0.008910	(0.012459)	(0.010272)
2053	Dec 20, 1994	0.004131	-	(0.022386)	0.004131	0.000418	(0.023882)
2054	Dec 21, 1994	0.005286	(0.001050)	(0.019199)	0.002353	(0.000418)	(0.010630)
2055	Dec 22, 1994	0.004676	0.002100	(0.003699)	0.004104	0.001879	0.007605
2056	Dec 23, 1994	0.015047	0.001048	-	0.015099	0.001459	0.003026
2057	Dec 27, 1994	0.012557	0.025852	-	0.016577	0.025292	(0.003632)
2058	Dec 28, 1994	0.006220	0.020211	0.015324	0.008467	0.017311	0.003632
2059	Dec 29, 1994	(0.002822)	0.012921	0.007575	(0.003943)	0.010916	0.006024
2060	Dec 30, 1994	0.004512	0.015677	-	0.002255	0.012749	(0.000300)
5150	Jan 02, 2007	(0.001316)	0.038608				
5151	Jan 03, 2007	(0.041323)	(0.084310)	(0.054225)	(0.045748)	(0.006152)	(0.030347)
5152	Jan 04, 2007	(0.046692)	(0.027652)	(0.017493)	(0.047942)	(0.028745)	(0.042925)
5153	Jan 05, 2007	0.011435	0.023588	0.023257	0.012869	0.014603	-
5154	Jan 08, 2007	(0.003738)	(0.011027)	0.017094	(0.003915)	(0.005572)	0.020261
5155	Jan 09, 2007	(0.007697)	0.004901	(0.002829)	(0.008055)	(0.000385)	(0.005747)
5156	Jan 10, 2007	(0.031024)	(0.029571)	(0.008535)	(0.029548)	(0.020117)	0.011461
5157	Jan 11, 2007	(0.038546)	(0.013980)	(0.023122)	(0.040421)	(0.030010)	(0.005714)
5158	Jan 12, 2007	0.020025	0.012414	0.016011	0.021170	0.015550	(0.014430)
5159	Jan 16, 2007	(0.033212)	(0.013795)	(0.001497)	(0.034168)	(0.015617)	-
5160	Jan 17, 2007	0.020671	0.014749	0.005059	0.019914	0.013087	-
5161	Jan 18, 2007	(0.034825)	(0.015371)	(0.015139)	(0.034271)	(0.019593)	(0.008759)
5162	Jan 19, 2007	0.028688	0.032118	0.028695	0.029474	0.028686	0.031749
5163	Jan 22, 2007	(0.016879)	(0.002884)	-	(0.016680)	(0.003375)	0.014105
5164	Jan 23, 2007	0.047755	0.040795	0.029983	0.073689	0.044031	(0.002805)
5165	Jan 24, 2007	0.011683	0.004182	(0.000769)	0.005978	0.004810	0.011173
5166	Jan 25, 2007	(0.013924)	(0.003409)	0.004824	(0.020804)	(0.022216)	0.011050
5167	Jan 26, 2007	0.034724	0.024752	0.024949	0.021706	0.026940	0.024425
5168	Jan 29, 2007	(0.025049)	(0.024946)	0.004045	(0.025771)	(0.027069)	0.015958
5169	Jan 30, 2007	0.054408	0.056800	0.024244	0.053356	0.055931	0.007884
5170	Jan 31, 2007	0.019792	0.023287	(0.009795)	0.020329	0.010083	(0.002621)
5171	Feb 01, 2007	(0.014197)	(0.014860)	0.003971	(0.014553)	0.002595	(0.015873)
5172	Feb 02, 2007	0.028534	0.015633	0.016755	0.029576	0.015017	-

No	Tanggal	Cushing, OK WTI Spot Price FOB (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Spot Price FOB (Cents per Gallon)	Mont Belvieu, TX Propane Spot Price FOB (Cents per Gallon)	Cushing, OK Crude Oil Future Contract 1 (Dollars per Barrel)	New York Harbor No. 2 Heating Oil Future Contract 1 (Cents per Gallon)	Mont Belvieu, Tx Propane Future Contract 1 (Cents per Gallon)
5173	Feb 05, 2007	(0.005438)	(0.003036)	0.007052	(0.004755)	(0.005001)	0.028911
5174	Feb 06, 2007	0.003742	0.008607	(0.001223)	0.002381	0.009090	0.005168
5175	Feb 07, 2007	(0.019888)	(0.012908)	0.004375	(0.020071)	(0.014775)	0.005141
5176	Feb 08, 2007	0.034213	0.031470	0.014513	0.034069	0.034741	(0.010309)
5177	Feb 09, 2007	0.001672	(0.000058)	0.012430	0.003010	0.000058	0.020514
5178	Feb 12, 2007	(0.035712)	(0.049231)	(0.028162)	(0.035348)	(0.047302)	(0.023108)
5179	Feb 13, 2007	0.020902	0.030727	0.003146	0.021392	0.028637	-
5180	Feb 14, 2007	(0.016755)	(0.031520)	(0.017273)	(0.018111)	(0.032961)	-
5181	Feb 15, 2007	(0.001380)	(0.007899)	(0.024736)	(0.000172)	(0.006860)	(0.023654)
5182	Feb 16, 2007	0.024895	0.023693	0.006530	0.023855	0.028058	(0.002663)
5183	Feb 20, 2007	(0.018012)	(0.013296)	(0.020471)	(0.022477)	(0.017117)	(0.010724)
5184	Feb 21, 2007	0.018349	0.023095	0.008642	0.033861	0.022005	-
5185	Feb 22, 2007	0.014706	0.022631	0.027454	0.014543	0.025481	0.018692
5186	Feb 23, 2007	-	0.013853	0.017317	0.003112	0.014674	-
5187	Feb 26, 2007	0.018572	0.004861	0.014522	0.004081	0.003251	0.051558
5188	Feb 27, 2007	0.000814	0.000285	(0.008850)	0.001140	0.013068	0.005013
5189	Feb 28, 2007	0.005193	0.015280	(0.003744)	0.005355	0.000618	(0.005013)
5190	Mar 01, 2007	0.003071	(0.001968)	(0.001319)	0.003393	(0.002306)	(0.015190)
5191	Mar 02, 2007	(0.006313)	(0.007739)	(0.002541)	(0.005823)	(0.004570)	0.007624
5192	Mar 05, 2007	(0.025160)	(0.022134)	-	(0.025800)	(0.024851)	(0.010178)
5193	Mar 06, 2007	0.010107	0.013877	0.007605	0.010268	0.012961	0.007643
5194	Mar 07, 2007	0.019428	0.010070	0.033572	0.018448	0.011438	0.015114
5195	Mar 08, 2007	(0.003563)	(0.002267)	0.018100	(0.002916)	(0.003457)	0.014889
5196	Mar 09, 2007	(0.025805)	(0.028954)	(0.003555)	(0.026133)	(0.028273)	-
5197	Mar 12, 2007	(0.018824)	(0.015420)	(0.004245)	(0.019167)	(0.017617)	(0.014889)
5198	Mar 13, 2007	(0.015560)	0.008446	-	(0.016775)	0.004685	0.019803
5199	Mar 14, 2007	0.002066	0.004108	-	0.003962	0.011062	(0.009852)
5200	Mar 15, 2007	(0.010893)	(0.012673)	0.013825	(0.010544)	(0.012068)	0.009852
5201	Mar 16, 2007	(0.008029)	0.005914	-	(0.007675)	0.000178	(0.014815)
5202	Mar 19, 2007	(0.007211)	(0.000590)	(0.024712)	(0.009147)	(0.000237)	(0.004988)
5203	Mar 20, 2007	(0.004246)	(0.010260)	-	0.002471	(0.011736)	-
5204	Mar 21, 2007	0.010054	(0.002447)	0.011466	0.049520	(0.002460)	-
5205	Mar 22, 2007	0.055138	0.026653	0.001255	0.034298	0.031576	0.014889
5206	Mar 23, 2007	0.014182	(0.004432)	0.002410	0.009519	(0.004024)	0.004914
5207	Mar 26, 2007	0.011397	0.034184	0.019070	0.010065	0.037284	0.019418
5208	Mar 27, 2007	0.019399	0.007540	0.004711	0.000318	0.005782	0.004796
5209	Mar 28, 2007	0.017783	0.016457	0.020930	0.018109	0.022692	0.030627
5210	Mar 29, 2007	0.030568	0.030412	0.020501	0.029977	0.026887	0.009238
5211	Mar 30, 2007	(0.002424)	0.000535	(0.012524)	(0.002426)	0.001171	0.004587
5212	Apr 02, 2007	0.001364	(0.006275)	(0.011481)	0.001062	(0.009033)	(0.011508)
5213	Apr 03, 2007	(0.022050)	(0.013541)	(0.017426)	(0.019912)	(0.012861)	(0.018692)
5214	Apr 04, 2007	(0.002946)	0.016871	-	(0.004030)	0.013880	(0.009479)
5215	Apr 05, 2007	(0.002176)	(0.003491)	0.001784	(0.001554)	(0.001879)	0.009479
5216	Apr 09, 2007	(0.043738)	(0.019780)	(0.005929)	(0.044049)	(0.024589)	0.002356
5217	Apr 10, 2007	0.006643	0.021554	0.007055	0.006159	0.022006	-
5218	Apr 11, 2007	0.000969	0.005784	0.009886	0.001937	0.009971	0.004695
5219	Apr 12, 2007	0.030038	0.021188	0.027462	0.029241	0.016611	0.020858
5220	Apr 13, 2007	(0.003765)	(0.008453)	0.003965	(0.003452)	(0.002837)	0.015928
5221	Apr 16, 2007	-	(0.017070)	(0.003965)	(0.000314)	(0.022022)	(0.006795)
5222	Apr 17, 2007	(0.007731)	(0.029942)	(0.003346)	(0.008050)	(0.033636)	0.002270
5223	Apr 18, 2007	-	0.002374	0.002262	0.000475	0.004883	(0.006826)
5224	Apr 19, 2007	(0.021289)	(0.001490)	0.007833	(0.020807)	(0.000443)	-
5225	Apr 20, 2007	0.027919	0.013818	0.006704	0.024760	0.014677	0.013606
5226	Apr 23, 2007	0.027467	0.031783	0.016610	0.038838	0.033168	0.008969
5227	Apr 24, 2007	(0.019007)	(0.023809)	0.001051	(0.020082)	(0.025828)	0.004454
5228	Apr 25, 2007	0.019007	0.027968	0.015201	0.019323	0.029622	0.011050
5229	Apr 26, 2007	(0.003834)	(0.004423)	(0.009180)	(0.011918)	(0.006543)	0.008753
5230	Apr 27, 2007	0.020833	0.009662	0.006504	0.021290	0.012834	0.002176
5231	Apr 30, 2007	(0.010134)	(0.008660)	0.004829	(0.011349)	-	0.008658
5232	May 01, 2007	(0.020736)	(0.003697)	(0.004310)	(0.020137)	(0.016121)	(0.008658)
5233	May 02, 2007	(0.010140)	(0.020581)	(0.011906)	(0.011243)	(0.016223)	(0.008734)
5234	May 03, 2007	(0.008661)	0.002266	(0.007723)	(0.007724)	(0.003948)	-
5235	May 04, 2007	(0.021420)	(0.011490)	(0.006009)	(0.020141)	(0.007834)	(0.008811)
5236	May 07, 2007	(0.006647)	(0.014551)	(0.007831)	(0.007455)	(0.015411)	(0.013363)
5237	May 08, 2007	0.012607	0.013733	0.006145	0.012770	0.014865	0.002240
5238	May 09, 2007	(0.011632)	(0.005196)	(0.000533)	(0.011469)	(0.007735)	-
5239	May 10, 2007	0.005025	0.024271	0.014814	0.004215	0.025394	0.019934
5240	May 11, 2007	0.008052	0.009482	0.001662	0.009019	0.010575	0.002191
5241	May 14, 2007	0.003203	(0.007664)	0.010864	0.001442	(0.008269)	0.013044
5242	May 15, 2007	0.009705	0.009306	(0.000519)	0.011303	0.012457	(0.002162)
5243	May 16, 2007	(0.009385)	(0.010482)	(0.007640)	(0.009863)	(0.012350)	(0.013072)
5244	May 17, 2007	0.035483	0.032729	0.021041	0.036265	0.036653	0.010905
5245	May 18, 2007	0.001541	(0.008422)	(0.004790)	0.001233	(0.011163)	0.012931
5246	May 21, 2007	0.020126	0.017235	0.005302	0.020274	0.018469	0.002139
5247	May 22, 2007	(0.020434)	(0.019430)	(0.011236)	(0.019812)	(0.022655)	(0.006431)
5248	May 23, 2007	0.002923	0.011186	(0.000518)	0.012238	0.013075	(0.004310)
5249	May 24, 2007	(0.022997)	(0.001450)	0.001035	(0.024472)	(0.001657)	(0.008677)
5250	May 25, 2007	0.015132	0.005992	0.011826	0.015768	0.005170	0.015135
5251	May 29, 2007	(0.021914)	(0.030912)	(0.020484)	(0.031947)	(0.036820)	(0.008621)
5252	May 30, 2007	0.004421	(0.005326)	-	0.005370	0.003472	(0.006515)
5253	May 31, 2007	0.008628	0.010096	(0.014716)	0.008157	0.003832	(0.010953)

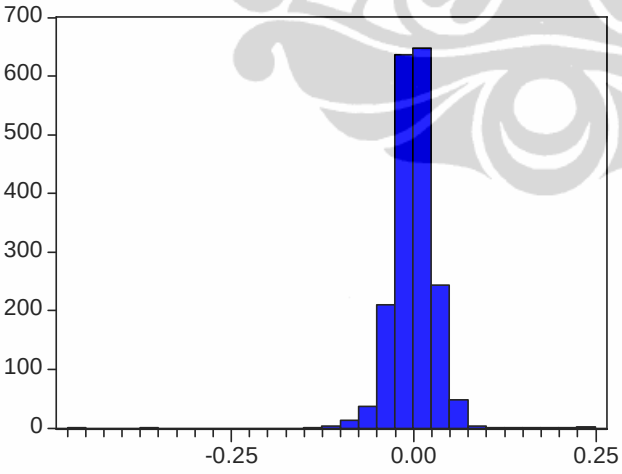
Lampiran 3 : *Output* Eviews untuk Statistik Deskriptif Data *Return*
Periode 4 Januari 2000- 31 Mei 2007

1. WTI SPOT



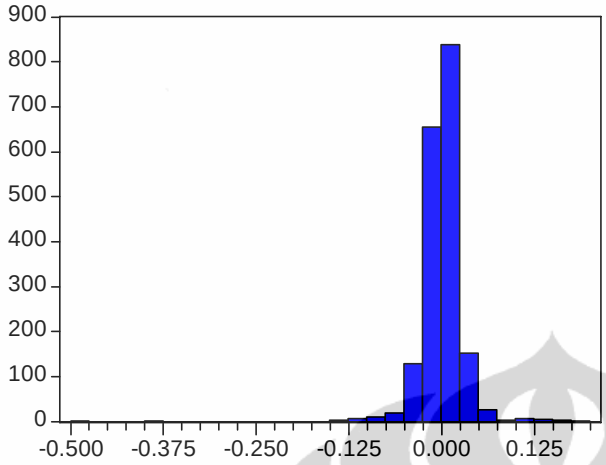
Series: WTISPOT	
Sample 1 1853	
Observations 1853	
Mean	0.000491
Median	0.001379
Maximum	0.124425
Minimum	-0.170918
Std. Dev.	0.024630
Skewness	-0.561952
Kurtosis	6.965195
Jarque-Bera	1311.455
Probability	0.000000

2. HEATING OIL SPOT



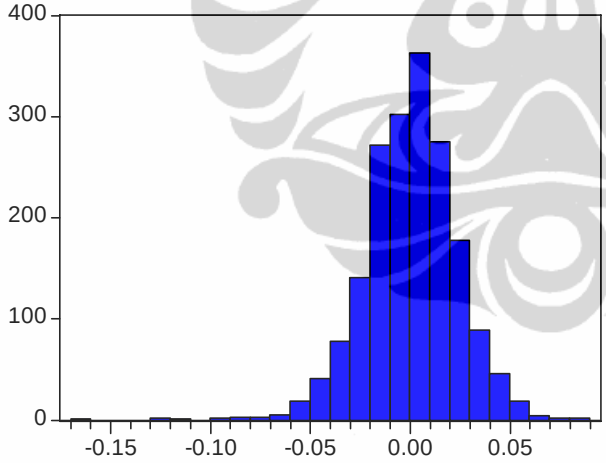
Series: HEATINGSPOT	
Sample 1 1853	
Observations 1853	
Mean	0.000538
Median	0.000296
Maximum	0.229538
Minimum	-0.470117
Std. Dev.	0.031552
Skewness	-1.974517
Kurtosis	44.25663
Jarque-Bera	132621.1
Probability	0.000000

3. PROPANE SPOT



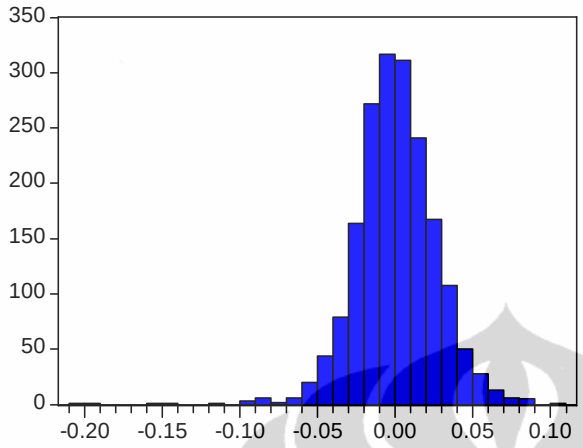
Series: PROPANESPOT	
Sample 1 1853	
Observations 1853	
Mean	0.000489
Median	0.000000
Maximum	0.177215
Minimum	-0.498613
Std. Dev.	0.028732
Skewness	-3.902304
Kurtosis	75.43769
Jarque-Bera	409832.0
Probability	0.000000

4. WTI FUTURE



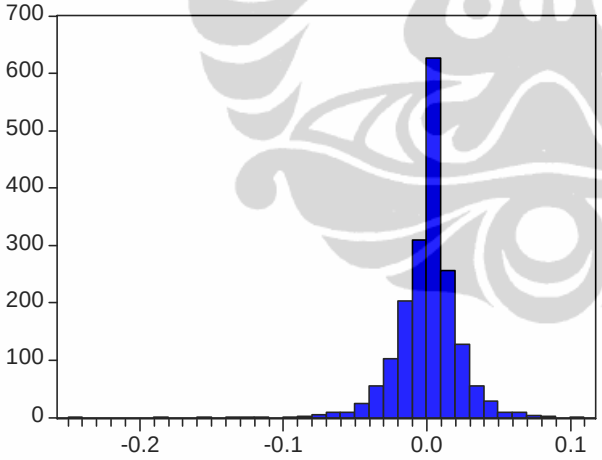
Series: WTIFUTURE	
Sample 1 1848	
Observations 1848	
Mean	0.000496
Median	0.001473
Maximum	0.081129
Minimum	-0.165445
Std. Dev.	0.023440
Skewness	-0.540803
Kurtosis	5.915738
Jarque-Bera	744.6980
Probability	0.000000

5. HEATING OIL FUTURE



Series: HEATINGFUTURE	
Sample 1 1848	
Observations 1848	
Mean	0.000543
Median	0.000000
Maximum	0.104031
Minimum	-0.209710
Std. Dev.	0.026153
Skewness	-0.686759
Kurtosis	8.412489
Jarque-Bera	2400.982
Probability	0.000000

6. PROPANE FUTURE



Series: PROPANEFUTURE	
Sample 1 1847	
Observations 1847	
Mean	0.000507
Median	0.000000
Maximum	0.107420
Minimum	-0.247836
Std. Dev.	0.021982
Skewness	-1.595176
Kurtosis	18.77632
Jarque-Bera	19937.65
Probability	0.000000

Lampiran 4 : *Output* Eviews untuk Pengujian Stationeritas dan Heteroskedastisitas Periode 4 Januari 2000- 31 Mei 2007

1. WTI SPOT

Null Hypothesis: WTISPOT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=24)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-44.83585	0.0001
Test critical values:	1% level	-3.433680	
	5% level	-2.862897	
	10% level	-2.567539	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(WTISPOT)
Method: Least Squares
Date: 08/28/08 Time: 08:49
Sample(adjusted): 2 1853
Included observations: 1852 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
WTISPOT(-1)	-1.041513	0.023229	-44.83585	0.0000
C	0.000516	0.000572	0.901702	0.3673

R-squared	0.520757	Mean dependent var	8.87E-06
Adjusted R-squared	0.520498	S.D. dependent var	0.035556
S.E. of regression	0.024621	Akaike info criterion	-4.569343
Sum squared resid	1.121471	Schwarz criterion	-4.563378
Log likelihood	4233.212	F-statistic	2010.253
Durbin-Watson stat	2.001943	Prob(F-statistic)	0.000000

White Heteroskedasticity Test:

F-statistic	27.63678	Probability	0.000000
Obs*R-squared	53.75626	Probability	0.000000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 08/28/08 Time: 09:00
Sample: 2 1853
Included observations: 1852

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000499	3.69E-05	13.51527	0.0000
WTISPOT(-1)	0.001221	0.001412	0.864399	0.3875
WTISPOT(-1)^2	0.174386	0.023573	7.397756	0.0000
R-squared	0.029026	Mean dependent var		0.000606
Adjusted R-squared	0.027976	S.D. dependent var		0.001483
S.E. of regression	0.001462	Akaike info criterion		-10.21603
Sum squared resid	0.003954	Schwarz criterion		-10.20708
Log likelihood	9463.043	F-statistic		27.63678
Durbin-Watson stat	2.016190	Prob(F-statistic)		0.000000

2. HEATING OIL SPOT

Null Hypothesis: HEATINGSPOT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=24)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-43.25010	0.0000
Test critical values:	1% level	-3.433680	
	5% level	-2.862897	
	10% level	-2.567539	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HEATINGSPOT)
Method: Least Squares
Date: 09/01/08 Time: 17:49
Sample(adjusted): 2 1853
Included observations: 1852 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HEATINGSPOT(-1)	-1.005475	0.023248	-43.25010	0.0000
C	0.000550	0.000734	0.749640	0.4536
R-squared	0.502764	Mean dependent var		1.43E-05
Adjusted R-squared	0.502496	S.D. dependent var		0.044753
S.E. of regression	0.031566	Akaike info criterion		-4.072396
Sum squared resid	1.843357	Schwarz criterion		-4.066431
Log likelihood	3773.039	F-statistic		1870.571
Durbin-Watson stat	1.999735	Prob(F-statistic)		0.000000

White Heteroskedasticity Test:

F-statistic	154.6289	Probability	0.000000
Obs*R-squared	265.3740	Probability	0.000000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/01/08 Time: 17:51
Sample: 2 1853
Included observations: 1852

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000598	0.000142	4.199517	0.0000
HEATINGSPOT(-1)	0.049056	0.004661	10.52551	0.0000
HEATINGSPOT(-1)^2	0.372795	0.022500	16.56899	0.0000

R-squared	0.143290	Mean dependent var	0.000995
Adjusted R-squared	0.142364	S.D. dependent var	0.006528
S.E. of regression	0.006046	Akaike info criterion	-7.377337
Sum squared resid	0.067581	Schwarz criterion	-7.368389
Log likelihood	6834.414	F-statistic	154.6289
Durbin-Watson stat	2.047154	Prob(F-statistic)	0.000000

3. PROPANE SPOT

Null Hypothesis: PROPANESPOT has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic based on SIC, MAXLAG=24)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-22.30499	0.0000
Test critical values:	1% level	-3.433685	
	5% level	-2.862900	
	10% level	-2.567541	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(PROPANESPOT)
Method: Least Squares
Date: 09/06/08 Time: 14:16
Sample(adjusted): 5 1853
Included observations: 1849 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PROPANESPOT(-1)	-1.010968	0.045325	-22.30499	0.0000
D(PROPANESPOT(-1))	-0.027825	0.040061	-0.694582	0.4874
D(PROPANESPOT(-2))	0.057989	0.033347	1.738947	0.0822
D(PROPANESPOT(-3))	0.100024	0.023071	4.335558	0.0000
C	0.000479	0.000661	0.725180	0.4684

R-squared	0.530146	Mean dependent var	-1.67E-05
Adjusted R-squared	0.529127	S.D. dependent var	0.041372
S.E. of regression	0.028390	Akaike info criterion	-4.282888
Sum squared resid	1.486206	Schwarz criterion	-4.267955
Log likelihood	3964.530	F-statistic	520.1569
Durbin-Watson stat	1.998930	Prob(F-statistic)	0.000000

White Heteroskedasticity Test:

F-statistic	89.96148	Probability	0.000000
Obs*R-squared	164.2336	Probability	0.000000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/06/08 Time: 14:17
Sample: 2 1853
Included observations: 1852

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000572	0.000156	3.677212	0.0002
PROPANESPOT(-1)	0.072789	0.006006	12.12029	0.0000
PROPANESPOT(-1)^2	0.256792	0.024275	10.57854	0.0000

R-squared	0.088679	Mean dependent var	0.000821
Adjusted R-squared	0.087693	S.D. dependent var	0.006945
S.E. of regression	0.006634	Akaike info criterion	-7.191648
Sum squared resid	0.081370	Schwarz criterion	-7.182700
Log likelihood	6662.466	F-statistic	89.96148
Durbin-Watson stat	2.003803	Prob(F-statistic)	0.000000

4. WTI FUTURE

Null Hypothesis: WTIFUTURE has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=24)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-43.36501	0.0000
Test critical values:	1% level	-3.433689	
	5% level	-2.862902	
	10% level	-2.567542	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(WTIFUTURE)
Method: Least Squares
Date: 09/11/08 Time: 17:50
Sample(adjusted): 2 1848
Included observations: 1847 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
WTIFUTURE(-1)	-1.009561	0.023281	-43.36501	0.0000
C	0.000502	0.000546	0.919650	0.3579

R-squared	0.504768	Mean dependent var	5.47E-06
Adjusted R-squared	0.504499	S.D. dependent var	0.033315
S.E. of regression	0.023451	Akaike info criterion	-4.666693
Sum squared resid	1.014689	Schwarz criterion	-4.660714
Log likelihood	4311.691	F-statistic	1880.524
Durbin-Watson stat	1.999858	Prob(F-statistic)	0.000000

White Heteroskedasticity Test:

F-statistic	7.544011	Probability	0.000546
Obs*R-squared	14.98992	Probability	0.000556

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/11/08 Time: 17:51
Sample: 2 1848
Included observations: 1847

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000524	3.13E-05	16.74848	0.0000
WTIFUTURE(-1)	-0.003420	0.001240	-2.757716	0.0059
WTIFUTURE(-1)^2	0.048962	0.023975	2.042215	0.0413

R-squared	0.008116	Mean dependent var	0.000549
Adjusted R-squared	0.007040	S.D. dependent var	0.001221
S.E. of regression	0.001217	Akaike info criterion	-10.58344
Sum squared resid	0.002731	Schwarz criterion	-10.57447
Log likelihood	9776.807	F-statistic	7.544011
Durbin-Watson stat	2.002278	Prob(F-statistic)	0.000546

5. HEATING OIL FUTURE

Null Hypothesis: HEATINGFUTURE has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=24)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-44.87736	0.0001
Test critical values:	1% level	-3.433689	
	5% level	-2.862902	
	10% level	-2.567542	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HEATINGFUTURE)
Method: Least Squares
Date: 09/14/08 Time: 12:44
Sample(adjusted): 2 1848
Included observations: 1847 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HEATINGFUTURE(-1)	-1.043652	0.023256	-44.87736	0.0000
C	0.000577	0.000608	0.948078	0.3432

R-squared	0.521894	Mean dependent var	1.20E-05
Adjusted R-squared	0.521635	S.D. dependent var	0.037792
S.E. of regression	0.026138	Akaike info criterion	-4.449749
Sum squared resid	1.260523	Schwarz criterion	-4.443770
Log likelihood	4111.343	F-statistic	2013.977
Durbin-Watson stat	2.003111	Prob(F-statistic)	0.000000

White Heteroskedasticity Test:

F-statistic	10.48550	Probability	0.000030
Obs*R-squared	20.76892	Probability	0.000031

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/14/08 Time: 12:45
Sample: 2 1848
Included observations: 1847

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000615	4.57E-05	13.45975	0.0000
HEATINGFUTURE(-1)	0.005239	0.001678	3.121742	0.0018
HEATINGFUTURE(-1)^2	0.094582	0.023664	3.996870	0.0001

R-squared	0.011245	Mean dependent var	0.000682
Adjusted R-squared	0.010172	S.D. dependent var	0.001841
S.E. of regression	0.001832	Akaike info criterion	-9.765167
Sum squared resid	0.006189	Schwarz criterion	-9.756199
Log likelihood	9021.132	F-statistic	10.48550
Durbin-Watson stat	2.003626	Prob(F-statistic)	0.000030

6. PROPANE FUTURE

Null Hypothesis: PROPANEFUTURE has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=24)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-40.10700	0.0000
Test critical values:	1% level	-3.433691	
	5% level	-2.862902	
	10% level	-2.567542	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(PROPANEFUTURE)
Method: Least Squares
Date: 09/15/08 Time: 19:03
Sample(adjusted): 2 1847
Included observations: 1846 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PROPANEFUTURE(-1)	-0.929560	0.023177	-40.10700	0.0000
C	0.000506	0.000510	0.992233	0.3212

R-squared	0.465905	Mean dependent var	2.86E-05
Adjusted R-squared	0.465616	S.D. dependent var	0.029942
S.E. of regression	0.021888	Akaike info criterion	-4.804657
Sum squared resid	0.883447	Schwarz criterion	-4.798676
Log likelihood	4436.698	F-statistic	1608.572
Durbin-Watson stat	2.004028	Prob(F-statistic)	0.000000

White Heteroskedasticity Test:

F-statistic	3.822858	Probability	0.022039
Obs*R-squared	7.626523	Probability	0.022076

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/15/08 Time: 19:10
Sample: 2 1847
Included observations: 1846

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000448	4.94E-05	9.060091	0.0000
PROPANEFUTURE(-1)	0.005349	0.002338	2.287954	0.0223
PROPANEFUTURE(-1)^2	0.057945	0.025332	2.287398	0.0223

R-squared	0.004131	Mean dependent var	0.000479
Adjusted R-squared	0.003051	S.D. dependent var	0.002055
S.E. of regression	0.002052	Akaike info criterion	-9.538442
Sum squared resid	0.007760	Schwarz criterion	-9.529470
Log likelihood	8806.982	F-statistic	3.822858
Durbin-Watson stat	2.016698	Prob(F-statistic)	0.022039

Lampiran 5 : Perhitungan Volatilitas WTI Spot Menggunakan Metode EWMA

Decay Factor = 0.98

Tanggal	*Day Number*	*Return*	$R_{WTISpot} - R_{Mean}$	$(R_{WTISpot} - R_{Mean})^2$	$\lambda^{(i-1)}$	$(R_{WTISpot} - R_{Mean})^2 \times \lambda^{(i-1)}$	Actual Var	Error	Error Square
		(a)	(b)	(c) = (b)^2	(d)	(e) = (c) x (d)	(f) = (a)^2	(g) = (f) -(e)	(h) = (g)^2
Jan 04, 2000	1853	-0.007794272	-0.008285568	6.86506E-05	5.63238E-17	3.86667E-21	6.07507E-05	6.07507E-05	3.69064E-09
Jan 05, 2000	1852	-0.036251729	-0.036743026	0.00135005	5.74733E-17	7.75918E-20	0.001314188	0.001314188	1.72709E-06
Jan 06, 2000	1851	0.005663446	0.005172149	2.67511E-05	5.86462E-17	1.56885E-21	3.20746E-05	3.20746E-05	1.02878E-09
Mar 21, 2007	50	0.010053881	0.009562585	9.1443E-05	0.371601714	3.39804E-05	0.000101081	6.71001E-05	4.50243E-09
Mar 22, 2007	49	0.055138122	0.054646826	0.002986276	0.379185423	0.001132352	0.003040213	0.00190786	3.63993E-06
Mar 23, 2007	48	0.014182296	0.013690999	0.000187443	0.386923901	7.25264E-05	0.000201138	0.000128611	1.65408E-08
Mar 26, 2007	47	0.011397062	0.010905766	0.000118936	0.394820307	4.69582E-05	0.000129893	8.29348E-05	6.87818E-09
Mar 27, 2007	46	0.019399406	0.018908109	0.000357517	0.402877864	0.000144036	0.000376337	0.000232301	5.3964E-08
Mar 28, 2007	45	0.017783142	0.017291846	0.000299008	0.411099862	0.000122922	0.00031624	0.000193318	3.73719E-08
Mar 29, 2007	44	0.030568389	0.030077092	0.000904631	0.419489655	0.000379484	0.000934426	0.000554943	3.07962E-07
Mar 30, 2007	43	-0.002423509	-0.002914806	8.49609E-06	0.428050668	3.63676E-06	5.8734E-06	2.23664E-06	5.00255E-12
Apr 02, 2007	42	0.001363947	0.00087265	7.61518E-07	0.436786396	3.32621E-07	1.86035E-06	1.52773E-06	2.33396E-12
Apr 03, 2007	41	-0.022049584	-0.022540881	0.000508091	0.445700404	0.000226457	0.000486184	0.000259728	6.74585E-08
Apr 04, 2007	40	-0.002945967	-0.003437264	1.18148E-05	0.454796331	5.37332E-06	8.67872E-06	3.3054E-06	1.09257E-11
Apr 05, 2007	39	-0.002176279	-0.002667576	7.11596E-06	0.464077888	3.30236E-06	4.73619E-06	1.43383E-06	2.05587E-12
Apr 09, 2007	38	-0.04373759	-0.044228887	0.001956194	0.473548866	0.000926354	0.001912977	0.000986623	9.73425E-07
Apr 10, 2007	37	0.006643466	0.006152169	3.78492E-05	0.483213128	1.82892E-05	4.41356E-05	2.58464E-05	6.68037E-10
Apr 11, 2007	36	0.000968523	0.000477226	2.27745E-07	0.493074621	1.12295E-07	9.38037E-07	8.25742E-07	6.81849E-13
Apr 12, 2007	35	0.030038015	0.029546719	0.000873009	0.503137368	0.000439243	0.000902282	0.000463039	2.14405E-07
Apr 13, 2007	34	-0.00376471	-0.004256007	1.81136E-05	0.513405478	9.29962E-06	1.4173E-05	4.87342E-06	2.37503E-11
Apr 16, 2007	33	0	-0.000491297	2.41372E-07	0.52388314	1.26451E-07	0	-1.26451E-07	1.59898E-14
Apr 17, 2007	32	-0.007730574	-0.008221871	6.75992E-05	0.534574633	3.61368E-05	5.97618E-05	2.3625E-05	5.5814E-10
Apr 18, 2007	31	0	-0.000491297	2.41372E-07	0.545484319	1.31665E-07	0	-1.31665E-07	1.73356E-14
Apr 19, 2007	30	-0.021289319	-0.021780616	0.000474395	0.556616652	0.000264056	0.000453235	0.000189179	3.57886E-08
Apr 20, 2007	29	0.027919178	0.027427881	0.000752289	0.567976176	0.000427282	0.000779481	0.000352198	1.24044E-07
Apr 23, 2007	28	0.027467007	0.026975711	0.000727689	0.579567526	0.000421745	0.000754436	0.000332692	1.10684E-07
Apr 24, 2007	27	-0.019006985	-0.019498282	0.000380183	0.591395435	0.000224838	0.000361265	0.000136427	1.86123E-08
Apr 25, 2007	26	0.019006985	0.018515688	0.000342831	0.60346473	0.000206886	0.000361265	0.000154379	2.38329E-08
Apr 26, 2007	25	-0.003834067	-0.004325363	1.87088E-05	0.615780337	1.15205E-05	1.47001E-05	3.17958E-06	1.01097E-11
Apr 27, 2007	24	0.020832503	0.020341206	0.000413765	0.628347282	0.000259988	0.000433993	0.000174005	3.02778E-08
Apr 30, 2007	23	-0.010133944	-0.010625241	0.000112896	0.641170696	7.23854E-05	0.000102697	3.03114E-05	9.1878E-10
May 01, 2007	22	-0.020736478	-0.021227774	0.000450618	0.654255812	0.00029482	0.000430002	0.000135182	1.82741E-08
May 02, 2007	21	-0.010139702	-0.010630998	0.000113018	0.667607972	7.54518E-05	0.000102814	2.73617E-05	7.48665E-10
May 03, 2007	20	-0.00866079	-0.009152086	8.37607E-05	0.681232624	5.70605E-05	7.50093E-05	1.79488E-05	3.22158E-10
May 04, 2007	19	-0.021420256	-0.021911553	0.000480116	0.695135331	0.000333746	0.000458827	0.000125082	1.56454E-08
May 07, 2007	18	-0.006646697	-0.007137994	5.0951E-05	0.709321766	3.61406E-05	4.41786E-05	8.03796E-06	6.46088E-11
May 08, 2007	17	0.012607246	0.01211595	0.000146796	0.723797721	0.000106251	0.000158943	5.26919E-05	2.77643E-09
May 09, 2007	16	-0.011631795	-0.012123092	0.000146969	0.738569103	0.000108547	0.000135299	2.67516E-05	7.1565E-10
May 10, 2007	15	0.005024729	0.004533432	2.0552E-05	0.753641941	1.54889E-05	2.52479E-05	9.75905E-06	9.5239E-11
May 11, 2007	14	0.008051573	0.007560277	5.71578E-05	0.769022389	4.39556E-05	6.48278E-05	2.08722E-05	4.35649E-10
May 14, 2007	13	0.003202565	0.002711268	7.35098E-06	0.784716724	5.76843E-06	1.02564E-05	4.48799E-06	2.0142E-11
May 15, 2007	12	0.009704952	0.009213656	8.48915E-05	0.800731351	6.79752E-05	9.41861E-05	2.62109E-05	6.87009E-10
May 16, 2007	11	-0.009385259	-0.009876556	9.75464E-05	0.817072807	7.97025E-05	8.80831E-05	8.38062E-06	7.02347E-11
May 17, 2007	10	0.035482529	0.034991233	0.001224386	0.833747762	0.001020829	0.00125901	0.00023818	5.67299E-08
May 18, 2007	9	0.001541307	0.001050011	1.10252E-06	0.850763023	9.37985E-07	2.37563E-06	1.43764E-06	2.06682E-12
May 21, 2007	8	0.020125698	0.019634402	0.00038551	0.868125533	0.000334671	0.000405044	7.0372E-05	4.95234E-09
May 22, 2007	7	-0.02043377	-0.020925066	0.000437858	0.885842381	0.000387874	0.000417539	2.96654E-05	8.80037E-10
May 23, 2007	6	0.002922854	0.002431558	5.91247E-06	0.903920797	5.34441E-06	8.54308E-06	3.19867E-06	1.02315E-11
May 24, 2007	5	-0.022996663	-0.02348796	0.000551684	0.92236816	0.000508856	0.000528847	1.99905E-05	3.99621E-10
May 25, 2007	4	0.015131714	0.014640417	0.000214342	0.941192	0.000201737	0.000228969	2.7232E-05	7.4158E-10
May 29, 2007	3	-0.021913539	-0.022404836	0.000501977	0.9604	0.000482098	0.000480203	-1.89519E-06	3.59175E-12
May 30, 2007	2	0.004421293	0.003929996	1.54449E-05	0.98	1.5136E-05	1.95478E-05	4.41186E-06	1.94645E-11

Tanggal	*Day Number*	*Return*	$R_{WTISpot} - R_{Mean}$	$(R_{WTISpot} - R_{Mean})^2$	$\lambda^{(i-1)}$	$(R_{WTISpot} - R_{Mean})^2 \times \lambda^{(i-1)}$	Actual Var	Error	Error Square
		(a)	(b)	(c) = $(b)^2$	(d)	(e) = (c) x (d)	(f) = $(a)^2$	(g) = (f) -(e)	(h) = $(g)^2$
May 31, 2007	1	0.008628181	0.008136885	6.62089E-05	1	6.62089E-05	7.44455E-05	8.23662E-06	6.78419E-11

Mean Return	0.000491297	Sum	0.01676357	Mean S.E	2.52908E-06
		Variance	0.000335271	RMSE 0.98	0.001590309
		Stdev EWMA	0.018310418	RMSE 0.99	0.001584084
		Stdev Normal	0.0246298	RMSE 0.97	0.001592421
				RMSE 0.96	0.001593446
				RMSE 0.95	0.001594002
				RMSE 0.94	0.001594328
				RMSE 0.93	0.001594533
				RMSE 0.92	0.001594668
				RMSE 0.91	0.001594762
				RMSE 0.90	0.001594829
				RMSE 0.89	0.001594880
				RMSE 0.88	0.001594919
				RMSE 0.87	0.001594950
				RMSE 0.86	0.001594976
				RMSE 0.85	0.001594998
				RMSE 0.84	0.001595017
				RMSE 0.83	0.001595034
				RMSE 0.82	0.001595049
				RMSE 0.81	0.001595063
				RMSE 0.80	0.001595075
				RMSE 0.79	0.001595086
				RMSE 0.78	0.001595096
				RMSE 0.77	0.001595106
				RMSE 0.76	0.001595115
				RMSE 0.75	0.001595123

Lampiran 6 : Perhitungan Volatilitas Heating Oil Spot Menggunakan Metode EWMA

Decay Factor = 0.98

Tanggal	*Day Number*	*Return*	$R_{WTISpot} - R_{Mean}$	$(R_{WTISpot} - R_{Mean})^2$	$\lambda^{(i-1)}$	$(R_{WTISpot} - R_{Mean})^2 \times \lambda^{(i-1)}$	Actual Var	Error	Error Square
		(a)	(b)	(c) = (b)^2	(d)	(e) = (c) x (d)	(f) = (a)^2	(g) = (f) -(e)	(h) = (g)^2
Jan 04, 2000	1853	-0.016462466	-0.017000307	0.00028901	5.63238E-17	1.62782E-20	0.000271013	0.000271013	7.34479E-08
Jan 05, 2000	1852	-0.024019426	-0.024557268	0.000603059	5.74733E-17	3.46598E-20	0.000576933	0.000576933	3.32852E-07
Jan 06, 2000	1851	0.007133334	0.006595493	4.35005E-05	5.86462E-17	2.55114E-21	5.08845E-05	5.08845E-05	2.58923E-09
Mar 21, 2007	50	-0.002447105	-0.002984946	8.9099E-06	0.371601714	3.31094E-06	5.98832E-06	2.67739E-06	7.1684E-12
Mar 22, 2007	49	0.026652521	0.02611468	0.000681976	0.379185423	0.000258596	0.000710357	0.000451761	2.04088E-07
Mar 23, 2007	48	-0.004432011	-0.004969852	2.46994E-05	0.386923901	9.5568E-06	1.96427E-05	1.00859E-05	1.01726E-10
Mar 26, 2007	47	0.034183998	0.033646156	0.001132064	0.394820307	0.000446962	0.001168546	0.000721584	5.20683E-07
Mar 27, 2007	46	0.007539986	0.007002145	4.903E-05	0.402877864	1.97531E-05	5.68514E-05	3.70983E-05	1.37628E-09
Mar 28, 2007	45	0.016456701	0.01591886	0.00025341	0.411099862	0.000104177	0.000270823	0.000166646	2.77709E-08
Mar 29, 2007	44	0.030412336	0.029874494	0.000892485	0.419489655	0.000374388	0.00092491	0.000550522	3.03074E-07
Mar 30, 2007	43	0.000534759	-3.08189E-06	9.49802E-12	0.428050668	4.06563E-12	2.85968E-07	2.85964E-07	8.17751E-14
Apr 02, 2007	42	-0.006274657	-0.006812498	4.64101E-05	0.436786396	2.02713E-05	3.93713E-05	1.91E-05	3.6481E-10
Apr 03, 2007	41	-0.013540802	-0.014078643	0.000198208	0.445700404	8.83415E-05	0.000183353	9.50118E-05	9.02725E-09
Apr 04, 2007	40	0.016870736	0.016332895	0.000266763	0.454796331	0.000121323	0.000284622	0.000163299	2.66665E-08
Apr 05, 2007	39	-0.003491342	-0.004029184	1.62343E-05	0.464077888	7.53399E-06	1.21895E-05	4.65548E-06	2.16735E-11
Apr 09, 2007	38	-0.019780029	-0.02031787	0.000412816	0.473548866	0.000195488	0.00039125	0.000195761	3.83224E-08
Apr 10, 2007	37	0.02155408	0.021016238	0.000441682	0.483213128	0.000213427	0.000464578	0.000251152	6.30772E-08
Apr 11, 2007	36	0.005784078	0.005246237	2.7523E-05	0.493074621	1.35709E-05	3.34556E-05	1.98847E-05	3.954E-10
Apr 12, 2007	35	0.021188017	0.020650176	0.00042643	0.503137368	0.000214553	0.000448932	0.000234379	5.49337E-08
Apr 13, 2007	34	-0.008453047	-0.008990888	8.08361E-05	0.513405478	4.15017E-05	7.1454E-05	2.99523E-05	8.97142E-10
Apr 16, 2007	33	-0.017069889	-0.01760773	0.000310032	0.52388314	0.000162421	0.000291381	0.00012896	1.66308E-08
Apr 17, 2007	32	-0.029942357	-0.030480198	0.000929042	0.534574633	0.000496643	0.000896545	0.000399902	1.59922E-07
Apr 18, 2007	31	0.002373528	0.001835687	3.36975E-06	0.545484319	1.83814E-06	5.63364E-06	3.79549E-06	1.44058E-11
Apr 19, 2007	30	-0.001489697	-0.002027538	4.11091E-06	0.556616652	2.2882E-06	2.2192E-06	-6.90049E-08	4.76168E-15
Apr 20, 2007	29	0.013818282	0.013280441	0.00017637	0.567976176	0.000100174	0.000190945	9.07709E-05	8.23936E-09
Apr 23, 2007	28	0.031782734	0.031244892	0.000976243	0.579567526	0.000565799	0.001010142	0.000444343	1.97441E-07
Apr 24, 2007	27	-0.023809378	-0.024347219	0.000592787	0.591395435	0.000350572	0.000566886	0.000216315	4.67921E-08
Apr 25, 2007	26	0.027968263	0.027430422	0.000752428	0.60346473	0.000454064	0.000782224	0.00032816	1.07689E-07
Apr 26, 2007	25	-0.004422689	-0.004960531	2.46069E-05	0.615780337	1.51524E-05	1.95602E-05	4.40776E-06	1.94283E-11
Apr 27, 2007	24	0.009662418	0.009124577	8.32579E-05	0.628347282	5.23149E-05	9.33623E-05	4.10474E-05	1.68489E-09
Apr 30, 2007	23	-0.008660335	-0.009198176	8.46064E-05	0.641170696	5.42472E-05	7.50014E-05	2.07542E-05	4.30738E-10
May 01, 2007	22	-0.003696862	-0.004234703	1.79327E-05	0.654255812	1.17326E-05	1.36668E-05	1.93421E-06	3.74116E-12
May 02, 2007	21	-0.020580708	-0.021118549	0.000445993	0.667607972	0.000297749	0.000423566	0.000125817	1.58299E-08
May 03, 2007	20	0.002265862	0.001728021	2.98606E-06	0.681232624	2.0342E-06	5.13413E-06	3.09993E-06	9.60958E-12
May 04, 2007	19	-0.011490019	-0.01202786	0.000144669	0.695135331	0.000100565	0.000132021	3.14557E-05	9.89462E-10
May 07, 2007	18	-0.014550703	-0.015088544	0.000227664	0.709321766	0.000161487	0.000211723	5.02358E-05	2.52364E-09
May 08, 2007	17	0.013732707	0.013194866	0.000174104	0.723797721	0.000126016	0.000188587	6.25708E-05	3.91511E-09
May 09, 2007	16	-0.005196238	-0.005734079	3.28797E-05	0.738569103	2.42839E-05	2.70009E-05	2.71698E-06	7.382E-12
May 10, 2007	15	0.024271195	0.023733354	0.000563272	0.753641941	0.000424505	0.000589091	0.000164585	2.70884E-08
May 11, 2007	14	0.009482279	0.008944437	8.0003E-05	0.769022389	6.15241E-05	8.99136E-05	2.83895E-05	8.05966E-10
May 14, 2007	13	-0.007664096	-0.008201938	6.72718E-05	0.784716724	5.27893E-05	5.87384E-05	5.94908E-06	3.53916E-11
May 15, 2007	12	0.00930635	0.008768509	7.68867E-05	0.800731351	6.15656E-05	8.66082E-05	2.50425E-05	6.27128E-10
May 16, 2007	11	-0.010482444	-0.011020285	0.000121447	0.817072807	9.92308E-05	0.000109882	1.06508E-05	1.13441E-10
May 17, 2007	10	0.032729429	0.032191588	0.001036298	0.833747762	0.000864011	0.001071216	0.000207204	4.29335E-08
May 18, 2007	9	-0.008421759	-0.0089596	8.02744E-05	0.850763023	6.82945E-05	7.0926E-05	2.6315E-06	6.9248E-12
May 21, 2007	8	0.017235113	0.016697272	0.000278799	0.868125533	0.000242032	0.000297049	5.50167E-05	3.02684E-09
May 22, 2007	7	-0.01943016	-0.019968001	0.000398721	0.885842381	0.000353204	0.000377531	2.43271E-05	5.91807E-10
May 23, 2007	6	0.01118609	0.010648249	0.000113385	0.903920797	0.000102491	0.000125129	2.26374E-05	5.1245E-10
May 24, 2007	5	-0.001449726	-0.001987567	3.95042E-06	0.92236816	3.64374E-06	2.10171E-06	-1.54204E-06	2.37789E-12
May 25, 2007	4	0.005992373	0.005454531	2.97519E-05	0.941192	2.80023E-05	3.59085E-05	7.90627E-06	6.25091E-11
May 29, 2007	3	-0.030911695	-0.031449536	0.000989073	0.9604	0.000949906	0.000955533	5.62686E-06	3.16616E-11
May 30, 2007	2	-0.005326244	-0.005864086	3.43875E-05	0.98	3.36997E-05	2.83689E-05	-5.33087E-06	2.84182E-11

Tanggal	*Day Number*	*Return*	$R_{WTISpot} - R_{Mean}$	$(R_{WTISpot} - R_{Mean})^2$	$\lambda^{(i-1)}$	$(R_{WTISpot} - R_{Mean})^2 \times \lambda^{(i-1)}$	Actual Var	Error	Error Square
		(a)	(b)	(c) = (b)^2	(d)	(e) = (c) x (d)	(f) = (a)^2	(g) = (f) -(e)	(h) = (g)^2
May 31, 2007	1	0.010095729	0.009557887	9.13532E-05	1	9.13532E-05	0.000101924	1.05705E-05	1.11736E-10

Mean Return	0.000537841	Sum	0.017239905	Mean S.E	4.36608E-05
		Variance	0.000344798	RMSE 0.98	0.006607632
		Stdev EWMA	0.01856874	RMSE 0.99	0.006604387
		Stdev Normal	0.0315518	RMSE 0.97	0.006608515
				RMSE 0.96	0.006608844
				RMSE 0.95	0.006608983
				RMSE 0.94	0.00660905
				RMSE 0.93	0.006609086
				RMSE 0.92	0.006609109
				RMSE 0.91	0.006609124
				RMSE 0.90	0.006609136
				RMSE 0.89	0.006609145
				RMSE 0.88	0.006609152
				RMSE 0.87	0.006609158
				RMSE 0.86	0.006609163
				RMSE 0.85	0.006609167
				RMSE 0.84	0.006609171
				RMSE 0.83	0.006609175
				RMSE 0.82	0.006609178
				RMSE 0.81	0.006609180
				RMSE 0.80	0.006609183
				RMSE 0.79	0.006609185
				RMSE 0.78	0.006609187
				RMSE 0.77	0.006609189
				RMSE 0.76	0.006609191
				RMSE 0.75	0.006609193

Lampiran 7 : Perhitungan Volatilitas Propane Spot Menggunakan Metode EWMA

Decay Factor = 0.98

Tanggal	*Day Number*	*Return*	$R_{WTISpot} - R_{Mean}$	$(R_{WTISpot} - R_{Mean})^2$	$\lambda^{(i-1)}$	$(R_{WTISpot} - R_{Mean})^2 \times \lambda^{(i-1)}$	Actual Var	Error	Error Square
		(a)	(b)	(c) = (b)^2	(d)	(e) = (c) x (d)	(f) = (a)^2	(g) = (f) -(e)	(h) = (g)^2
Jan 04, 2000	1853	-0.079587438	-0.080076927	0.006412314	5.63238E-17	3.61166E-19	0.00633416	0.00633416	4.01216E-05
Jan 05, 2000	1852	0.008249899	0.00776041	6.0224E-05	5.74733E-17	3.46127E-21	6.80608E-05	6.80608E-05	4.63228E-09
Jan 06, 2000	1851	0.076787143	0.076297654	0.005821332	5.86462E-17	3.41399E-19	0.005896265	0.005896265	3.47659E-05
Mar 21, 2007	50	0.011466455	0.010976966	0.000120494	0.371601714	4.47757E-05	0.00013148	8.67039E-05	7.51757E-09
Mar 22, 2007	49	0.00125525	0.000765761	5.8639E-07	0.379185423	2.22351E-07	1.57565E-06	1.3533E-06	1.83143E-12
Mar 23, 2007	48	0.002409524	0.001920034	3.68653E-06	0.386923901	1.42641E-06	5.8058E-06	4.3794E-06	1.91791E-11
Mar 26, 2007	47	0.019069991	0.018580501	0.000345235	0.394820307	0.000136306	0.000363665	0.000227359	5.1692E-08
Mar 27, 2007	46	0.004711212	0.004221723	1.78229E-05	0.402877864	7.18047E-06	2.21955E-05	1.5015E-05	2.25452E-10
Mar 28, 2007	45	0.020930023	0.020440534	0.000417815	0.411099862	0.000171764	0.000438066	0.000266302	7.09168E-08
Mar 29, 2007	44	0.020500923	0.020011434	0.000400457	0.419489655	0.000167988	0.000420288	0.0002523	6.36553E-08
Mar 30, 2007	43	-0.012523986	-0.013013476	0.000169351	0.428050668	7.24906E-05	0.00015685	8.43596E-05	7.11654E-09
Apr 02, 2007	42	-0.011481182	-0.011970672	0.000143297	0.436786396	6.25902E-05	0.000131818	6.92274E-05	4.79243E-09
Apr 03, 2007	41	-0.017425778	-0.017915267	0.000320957	0.445700404	0.000143051	0.000303658	0.000160607	2.57947E-08
Apr 04, 2007	40	0	-0.000489489	2.396E-07	0.454796331	1.08969E-07	0	-1.08969E-07	1.18743E-14
Apr 05, 2007	39	0.001784457	0.001294968	1.67694E-06	0.464077888	7.78231E-07	3.18429E-06	2.40606E-06	5.7891E-12
Apr 09, 2007	38	-0.00592915	-0.00641864	4.11989E-05	0.473548866	1.95097E-05	3.51548E-05	1.56451E-05	2.4477E-10
Apr 10, 2007	37	0.007054537	0.006565048	4.30999E-05	0.483213128	2.08264E-05	4.97665E-05	2.89401E-05	8.37528E-10
Apr 11, 2007	36	0.009886296	0.009396806	8.83E-05	0.493074621	4.35385E-05	9.77388E-05	5.42004E-05	2.93768E-09
Apr 12, 2007	35	0.02746168	0.026972191	0.000727499	0.503137368	0.000366032	0.000754144	0.000388112	1.50631E-07
Apr 13, 2007	34	0.003965041	0.003475551	1.20795E-05	0.513405478	6.20166E-06	1.57215E-05	9.51989E-06	9.06283E-11
Apr 16, 2007	33	-0.003965041	-0.00445453	1.98428E-05	0.52388314	1.03953E-05	1.57215E-05	5.32622E-06	2.83686E-11
Apr 17, 2007	32	-0.003346451	-0.00383594	1.47144E-05	0.534574633	7.86597E-06	1.11987E-05	3.33277E-06	1.11073E-11
Apr 18, 2007	31	0.002262342	0.001772853	3.14301E-06	0.545484319	1.71446E-06	5.11819E-06	3.40373E-06	1.15854E-11
Apr 19, 2007	30	0.007833291	0.007343801	5.39314E-05	0.556616652	3.00191E-05	6.13604E-05	3.13413E-05	9.82278E-10
Apr 20, 2007	29	0.006703936	0.006214446	3.86193E-05	0.567976176	2.19349E-05	4.49428E-05	2.30079E-05	5.29363E-10
Apr 23, 2007	28	0.016609623	0.016120134	0.000259859	0.579567526	0.000150606	0.00027588	0.000125274	1.56936E-08
Apr 24, 2007	27	0.00105088	0.000561391	3.1516E-07	0.591395435	1.86384E-07	1.10435E-06	9.17965E-07	8.4266E-13
Apr 25, 2007	26	0.015201161	0.014711672	0.000216433	0.60346473	0.00013061	0.000231075	0.000100465	1.00933E-08
Apr 26, 2007	25	-0.009179938	-0.009669427	9.34978E-05	0.615780337	5.75741E-05	8.42713E-05	2.66971E-05	7.12737E-10
Apr 27, 2007	24	0.006503947	0.006014458	3.61737E-05	0.628347282	2.27296E-05	4.23013E-05	1.95717E-05	3.83051E-10
Apr 30, 2007	23	0.004828844	0.004339355	1.883E-05	0.641170696	1.20732E-05	2.33177E-05	1.12445E-05	1.26439E-10
May 01, 2007	22	-0.004310352	-0.004799841	2.30385E-05	0.654255812	1.50731E-05	1.85791E-05	3.50608E-06	1.22926E-11
May 02, 2007	21	-0.011906454	-0.012395944	0.000153659	0.667607972	0.000102584	0.000141764	3.91794E-05	1.53503E-09
May 03, 2007	20	-0.007723402	-0.008212891	6.74516E-05	0.681232624	4.59502E-05	5.96509E-05	1.37007E-05	1.8771E-10
May 04, 2007	19	-0.006009209	-0.006498698	4.22331E-05	0.695135331	2.93577E-05	3.61106E-05	6.75288E-06	4.56015E-11
May 07, 2007	18	-0.007830615	-0.008320104	6.92241E-05	0.709321766	4.91022E-05	6.13185E-05	1.22163E-05	1.49239E-10
May 08, 2007	17	0.006145097	0.005655607	3.19859E-05	0.723797721	2.31513E-05	3.77622E-05	1.46109E-05	2.13478E-10
May 09, 2007	16	-0.00053286	-0.001022349	1.0452E-06	0.738569103	7.71951E-07	2.83939E-07	-4.88011E-07	2.38155E-13
May 10, 2007	15	0.014813779	0.01432429	0.000205185	0.753641941	0.000154636	0.000219448	6.48118E-05	4.20057E-09
May 11, 2007	14	0.001661638	0.001172149	1.37393E-06	0.769022389	1.05659E-06	2.76104E-06	1.70446E-06	2.90517E-12
May 14, 2007	13	0.010863532	0.010374042	0.000107621	0.784716724	8.44518E-05	0.000118016	3.35645E-05	1.12658E-09
May 15, 2007	12	-0.000518762	-0.001008251	1.01657E-06	0.800731351	8.14E-07	2.69114E-07	-5.44886E-07	2.96901E-13
May 16, 2007	11	-0.007639589	-0.008129079	6.60819E-05	0.817072807	5.39937E-05	5.83633E-05	4.36958E-06	1.90933E-11
May 17, 2007	10	0.0210407	0.020551211	0.000422352	0.833747762	0.000352135	0.000442711	9.05758E-05	8.20398E-09
May 18, 2007	9	-0.004790019	-0.005279508	2.78732E-05	0.850763023	2.37135E-05	2.29443E-05	-7.69214E-07	5.9169E-13
May 21, 2007	8	0.005301877	0.004812387	2.31591E-05	0.868125533	2.0105E-05	2.81099E-05	8.00492E-06	6.40787E-11
May 22, 2007	7	-0.011235591	-0.011725081	0.000137478	0.885842381	0.000121783	0.000126239	4.4551E-06	1.98479E-11
May 23, 2007	6	-0.000517643	-0.001007132	1.01432E-06	0.903920797	9.16861E-07	2.67954E-07	-6.48907E-07	4.2108E-13
May 24, 2007	5	0.001035018	0.000545529	2.97602E-07	0.92236816	2.74498E-07	1.07126E-06	7.96764E-07	6.34833E-13
May 25, 2007	4	0.011826344	0.011336855	0.000128524	0.941192	0.000120966	0.000139862	1.88964E-05	3.57074E-10
May 29, 2007	3	-0.020484407	-0.020973896	0.000439904	0.9604	0.000422484	0.000419611	-2.87319E-06	8.25522E-12
May 30, 2007	2	0	-0.000489489	2.396E-07	0.98	2.34808E-07	0	-2.34808E-07	5.51347E-14

Tanggal	*Day Number*	*Return*	$R_{WTISpot} - R_{Mean}$	$(R_{WTISpot} - R_{Mean})^2$	$\lambda^{(i-1)}$	$(R_{WTISpot} - R_{Mean})^2 \times \lambda^{(i-1)}$	Actual Var	Error	Error Square
		(a)	(b)	(c) = (b)^2	(d)	(e) = (c) x (d)	(f) = (a)^2	(g) = (f) -(e)	(h) = (g)^2
May 31, 2007	1	-0.014716453	-0.015205943	0.000231221	1	0.000231221	0.000216574	-1.46467E-05	2.14526E-10

Mean Return	0.000489489	Sum	0.007778959	Mean S.E	5.11693E-05
		Variance	0.000155579	RMSE 0.98	0.007153274
		Stdev EWMA	0.012473138	RMSE 0.99	0.007152060
		Stdev Normal	0.0287318	RMSE 0.97	0.007153426
				RMSE 0.96	0.007153489
				RMSE 0.95	0.007153518
				RMSE 0.94	0.007153532
				RMSE 0.93	0.007153540
				RMSE 0.92	0.007153545
				RMSE 0.91	0.007153548
				RMSE 0.90	0.007153550
				RMSE 0.89	0.007153552
				RMSE 0.88	0.007153553
				RMSE 0.87	0.007153554
				RMSE 0.86	0.007153554
				RMSE 0.85	0.007153555
				RMSE 0.84	0.007153556
				RMSE 0.83	0.007153556
				RMSE 0.82	0.007153557
				RMSE 0.81	0.007153557
				RMSE 0.80	0.007153557
				RMSE 0.79	0.007153558
				RMSE 0.78	0.007153558
				RMSE 0.77	0.007153558
				RMSE 0.76	0.007153559
				RMSE 0.75	0.007153559

Lampiran 8 : Perhitungan Volatilitas WTI Future Menggunakan Metode EWMA

Decay Factor = 0.98

Tanggal	*Day Number*	*Return*	$R_{WTISpot} - R_{Mean}$	$(R_{WTISpot} - R_{Mean})^2$	$\lambda^{(i-1)}$	$(R_{WTISpot} - R_{Mean})^2 \times \lambda^{(i-1)}$	Actual Var	Error	Error Square
		(a)	(b)	(c) = (b)^2	(d)	(e) = (c) x (d)	(f) = (a)^2	(g) = (f) -(e)	(h) = (g)^2
Jan 04, 2000	1848	-0.001955035	-0.002450948	6.00714E-06	6.23106E-17	3.74309E-22	3.82216E-06	3.82216E-06	1.46089E-11
Jan 05, 2000	1847	-0.025367987	-0.0258639	0.000668941	6.35822E-17	4.25328E-20	0.000643535	0.000643535	4.14137E-07
Jan 06, 2000	1846	-0.005232453	-0.005728366	3.28142E-05	6.48798E-17	2.12898E-21	2.73786E-05	2.73786E-05	7.49586E-10
Mar 21, 2007	50	0.049520174	0.049024261	0.002403378	0.371601714	0.000893099	0.002452248	0.001559148	2.43094E-06
Mar 22, 2007	49	0.034298498	0.033802585	0.001142615	0.379185423	0.000433263	0.001176387	0.000743124	5.52233E-07
Mar 23, 2007	48	0.009518504	0.009022591	8.14071E-05	0.386923901	3.14984E-05	9.06019E-05	5.91035E-05	3.49323E-09
Mar 26, 2007	47	0.010064787	0.009568874	9.15633E-05	0.394820307	3.61511E-05	0.0001013	6.51489E-05	4.24437E-09
Mar 27, 2007	46	0.000317864	-0.000178049	3.17014E-08	0.402877864	1.27718E-08	1.01037E-07	8.82657E-08	7.79083E-15
Mar 28, 2007	45	0.018109305	0.017613392	0.000310232	0.411099862	0.000127536	0.000327947	0.000200411	4.01645E-08
Mar 29, 2007	44	0.029976881	0.029480969	0.000869128	0.419489655	0.00036459	0.000898613	0.000534023	2.85181E-07
Mar 30, 2007	43	-0.002426082	-0.002921994	8.53805E-06	0.428050668	3.65472E-06	5.88587E-06	2.23115E-06	4.97804E-12
Apr 02, 2007	42	0.001062135	0.000566222	3.20607E-07	0.436786396	1.40037E-07	1.12813E-06	9.88094E-07	9.76329E-13
Apr 03, 2007	41	-0.019911823	-0.020407736	0.000416476	0.445700404	0.000185623	0.000396481	0.000210857	4.44608E-08
Apr 04, 2007	40	-0.004030388	-0.004526301	2.04874E-05	0.454796331	9.3176E-06	1.6244E-05	6.92643E-06	4.79755E-11
Apr 05, 2007	39	-0.001554485	-0.002050398	4.20413E-06	0.464077888	1.95104E-06	2.41642E-06	4.65379E-07	2.16578E-13
Apr 09, 2007	38	-0.044048778	-0.044544691	0.001984229	0.473548866	0.00093963	0.001940295	0.001000665	1.00133E-06
Apr 10, 2007	37	0.006158853	0.00566294	3.20689E-05	0.483213128	1.54961E-05	3.79315E-05	2.24354E-05	5.03345E-10
Apr 11, 2007	36	0.001937047	0.001441134	2.07687E-06	0.493074621	1.02405E-06	3.75215E-06	2.7281E-06	7.44253E-12
Apr 12, 2007	35	0.02924092	0.028745007	0.000826275	0.503137368	0.00041573	0.000855031	0.000439301	1.92986E-07
Apr 13, 2007	34	-0.003451525	-0.003947438	1.55823E-05	0.513405478	8.00002E-06	1.1913E-05	3.913E-06	1.53116E-11
Apr 16, 2007	33	-0.000314367	-0.000810279	6.56553E-07	0.52388314	3.43957E-07	9.88263E-08	-2.45131E-07	6.0089E-14
Apr 17, 2007	32	-0.008049921	-0.008545834	7.30313E-05	0.534574633	3.90407E-05	6.48012E-05	2.57606E-05	6.63607E-10
Apr 18, 2007	31	0.000475323	-2.059E-05	4.23949E-10	0.545484319	2.31258E-10	2.25932E-07	2.25701E-07	5.09407E-14
Apr 19, 2007	30	-0.020807409	-0.021303322	0.000453832	0.556616652	0.00025261	0.000432948	0.000180338	3.25218E-08
Apr 20, 2007	29	0.024759671	0.024263758	0.00058873	0.567976176	0.000334385	0.000613041	0.000278657	7.76496E-08
Apr 23, 2007	28	0.038838331	0.038342418	0.001470141	0.579567526	0.000852046	0.001508416	0.00065637	4.30822E-07
Apr 24, 2007	27	-0.02008192	-0.020577832	0.000423447	0.591395435	0.000250425	0.000403283	0.000152859	2.33658E-08
Apr 25, 2007	26	0.019322791	0.018826878	0.000354451	0.60346473	0.000213899	0.00037337	0.000159471	2.54311E-08
Apr 26, 2007	25	-0.011917635	-0.012413548	0.000154096	0.615780337	9.48894E-05	0.00014203	4.71406E-05	2.22224E-09
Apr 27, 2007	24	0.021290342	0.020794429	0.000432408	0.628347282	0.000271703	0.000453279	0.000181576	3.29699E-08
Apr 30, 2007	23	-0.011349142	-0.011845055	0.000140305	0.641170696	8.99597E-05	0.000128803	3.88434E-05	1.50881E-09
May 01, 2007	22	-0.020137488	-0.020633401	0.000425737	0.654255812	0.000278541	0.000405518	0.000126977	1.61233E-08
May 02, 2007	21	-0.011243092	-0.011739004	0.000137804	0.667607972	9.19992E-05	0.000126407	3.44079E-05	1.1839E-09
May 03, 2007	20	-0.007724481	-0.008220394	6.75749E-05	0.681232624	4.60342E-05	5.96676E-05	1.36334E-05	1.85869E-10
May 04, 2007	19	-0.020141346	-0.020637259	0.000425896	0.695135331	0.000296056	0.000405674	0.000109618	1.20161E-08
May 07, 2007	18	-0.007455464	-0.007951377	6.32244E-05	0.709321766	4.48464E-05	5.55839E-05	1.07375E-05	1.15294E-10
May 08, 2007	17	0.012769914	0.012274001	0.000150651	0.723797721	0.000109041	0.000163071	5.40298E-05	2.91922E-09
May 09, 2007	16	-0.011469312	-0.011965225	0.000143167	0.738569103	0.000105738	0.000131545	2.58067E-05	6.65985E-10
May 10, 2007	15	0.004215311	0.003719398	1.38339E-05	0.753641941	1.04258E-05	1.77688E-05	7.34302E-06	5.392E-11
May 11, 2007	14	0.009019227	0.008523314	7.26469E-05	0.769022389	5.58671E-05	8.13465E-05	2.54794E-05	6.49199E-10
May 14, 2007	13	0.001441961	0.000946048	8.95008E-07	0.784716724	7.02327E-07	2.07925E-06	1.37692E-06	1.89592E-12
May 15, 2007	12	0.011303153	0.01080724	0.000116796	0.800731351	9.35226E-05	0.000127761	3.42387E-05	1.17229E-09
May 16, 2007	11	-0.009863268	-0.010359181	0.000107313	0.817072807	8.76822E-05	9.72841E-05	9.60183E-06	9.2195E-11
May 17, 2007	10	0.036264864	0.035768951	0.001279418	0.833747762	0.001066712	0.00131514	0.000248429	6.17168E-08
May 18, 2007	9	0.001232666	0.000736753	5.42805E-07	0.850763023	4.61798E-07	1.51946E-06	1.05767E-06	1.11866E-12
May 21, 2007	8	0.020273539	0.019777627	0.000391155	0.868125533	0.000339571	0.000411016	7.14452E-05	5.10441E-09
May 22, 2007	7	-0.019811681	-0.020307594	0.000412398	0.885842381	0.00036532	0.000392503	2.71828E-05	7.38902E-10
May 23, 2007	6	0.012238182	0.01174227	0.000137881	0.903920797	0.000124633	0.000149773	2.51397E-05	6.32005E-10
May 24, 2007	5	-0.024472172	-0.024968084	0.000623405	0.92236816	0.000575009	0.000598887	2.3878E-05	5.70161E-10
May 25, 2007	4	0.015767833	0.01527192	0.000233232	0.941192	0.000219516	0.000248625	2.91089E-05	8.47328E-10
May 29, 2007	3	-0.03194662	-0.032442533	0.001052518	0.9604	0.001010838	0.001020587	9.7483E-06	9.50294E-11
May 30, 2007	2	0.005369564	0.004873652	2.37525E-05	0.98	2.32774E-05	2.88322E-05	5.55479E-06	3.08557E-11

Tanggal	*Day Number*	*Return*	$R_{WTISpot} - R_{Mean}$	$(R_{WTISpot} - R_{Mean})^2$	$\lambda^{(i-1)}$	$(R_{WTISpot} - R_{Mean})^2 \times \lambda^{(i-1)}$	Actual Var	Error	Error Square
		(a)	(b)	(c) = (b)^2	(d)	(e) = (c) x (d)	(f) = (a)^2	(g) = (f) -(e)	(h) = (g)^2
May 31, 2007	1	0.008156908	0.007660995	5.86908E-05	1	5.86908E-05	6.65351E-05	7.8443E-06	6.15331E-11

Mean Return	0.000495913	Sum	0.018688806	Mean S.E	1.75031E-06
		Variance	0.000373776	RMSE 0.98	0.001322993
		Stdev EWMA	0.019333291	RMSE 0.99	0.001314694
		Stdev Normal	0.0234398	RMSE 0.97	0.001326418
				RMSE 0.96	0.001328039
				RMSE 0.95	0.001328868
				RMSE 0.94	0.001329330
				RMSE 0.93	0.001329610
				RMSE 0.92	0.001329792
				RMSE 0.91	0.001329919
				RMSE 0.90	0.001330011
				RMSE 0.89	0.001330080
				RMSE 0.88	0.001330135
				RMSE 0.87	0.001330180
				RMSE 0.86	0.001330217
				RMSE 0.85	0.001330249
				RMSE 0.84	0.001330277
				RMSE 0.83	0.001330301
				RMSE 0.82	0.001330323
				RMSE 0.81	0.001330343
				RMSE 0.80	0.001330361
				RMSE 0.79	0.001330378
				RMSE 0.78	0.001330394
				RMSE 0.77	0.001330409
				RMSE 0.76	0.001330423
				RMSE 0.75	0.001330435

Lampiran 9 : Perhitungan Volatilitas Heating Oil Future Menggunakan Metode EWMA

Decay Factor = 0.98

Tanggal	*Day Number*	*Return*	$R_{WTISpot} - R_{Mean}$	$(R_{WTISpot} - R_{Mean})^2$	$\lambda^{(i-1)}$	$(R_{WTISpot} - R_{Mean})^2 \times \lambda^{(i-1)}$	Actual Var	Error	Error Square
		(a)	(b)	(c) = (b)^2	(d)	(e) = (c) x (d)	(f) = (a)^2	(g) = (f) -(e)	(h) = (g)^2
Jan 04, 2000	1848	-0.018274027	-0.018816957	0.000354078	6.23106E-17	2.20628E-20	0.00033394	0.00033394	1.11516E-07
Jan 05, 2000	1847	-0.018313621	-0.018856552	0.00035557	6.35822E-17	2.26079E-20	0.000335389	0.000335389	1.12486E-07
Jan 06, 2000	1846	-0.004065352	-0.004608283	2.12363E-05	6.48798E-17	1.37781E-21	1.65271E-05	1.65271E-05	2.73145E-10
Mar 21, 2007	50	-0.002460026	-0.003002957	9.01775E-06	0.371601714	3.35101E-06	6.05173E-06	2.70072E-06	7.29387E-12
Mar 22, 2007	49	0.031575969	0.031033039	0.000963049	0.379185423	0.000365174	0.000997042	0.000631868	3.99257E-07
Mar 23, 2007	48	-0.004024385	-0.004567316	2.08604E-05	0.386923901	8.07138E-06	1.61957E-05	8.1243E-06	6.60042E-11
Mar 26, 2007	47	0.037283511	0.03674058	0.00134987	0.394820307	0.000532956	0.00139006	0.000857104	7.34627E-07
Mar 27, 2007	46	0.005782472	0.005239542	2.74528E-05	0.402877864	1.10601E-05	3.3437E-05	2.23769E-05	5.00724E-10
Mar 28, 2007	45	0.02269177	0.022148839	0.000490571	0.411099862	0.000201674	0.000514916	0.000313243	9.8121E-08
Mar 29, 2007	44	0.026887113	0.026344183	0.000694016	0.419489655	0.000291133	0.000722917	0.000431784	1.86438E-07
Mar 30, 2007	43	0.001171272	0.000628341	3.94813E-07	0.428050668	1.69E-07	1.37188E-06	1.20288E-06	1.44692E-12
Apr 02, 2007	42	-0.009032906	-0.009575836	9.16966E-05	0.436786396	4.00518E-05	8.15934E-05	4.15415E-05	1.7257E-09
Apr 03, 2007	41	-0.012860871	-0.013403802	0.000179662	0.445700404	8.00754E-05	0.000165402	8.53266E-05	7.28063E-09
Apr 04, 2007	40	0.013880485	0.013337555	0.00017789	0.454796331	8.09039E-05	0.000192668	0.000111764	1.24912E-08
Apr 05, 2007	39	-0.001879044	-0.002421975	5.86596E-06	0.464077888	2.72226E-06	3.53081E-06	8.08543E-07	6.53742E-13
Apr 09, 2007	38	-0.024589173	-0.025132104	0.000631623	0.473548866	0.000299104	0.000604627	0.000305523	9.33445E-08
Apr 10, 2007	37	0.022006444	0.021463513	0.000460682	0.483213128	0.000222608	0.000484284	0.000261676	6.84742E-08
Apr 11, 2007	36	0.009971134	0.009428204	8.8891E-05	0.493074621	4.38299E-05	9.94235E-05	5.55936E-05	3.09065E-09
Apr 12, 2007	35	0.016610623	0.016067692	0.000258171	0.503137368	0.000129895	0.000275913	0.000146017	2.13211E-08
Apr 13, 2007	34	-0.00283703	-0.003379961	1.14241E-05	0.513405478	5.86521E-06	8.04874E-06	2.18353E-06	4.76779E-12
Apr 16, 2007	33	-0.022022167	-0.022565097	0.000509184	0.52388314	0.000266753	0.000484976	0.000218223	4.76213E-08
Apr 17, 2007	32	-0.033636378	-0.034179308	0.001168225	0.534574633	0.000624504	0.001131406	0.000506902	2.5695E-07
Apr 18, 2007	31	0.004882931	0.00434	1.88356E-05	0.545484319	1.02745E-05	2.3843E-05	1.35685E-05	1.84104E-10
Apr 19, 2007	30	-0.000442919	-0.00098585	9.71899E-07	0.556616652	5.40975E-07	1.96177E-07	-3.44798E-07	1.18886E-13
Apr 20, 2007	29	0.014677448	0.014134517	0.000199785	0.567976176	0.000113473	0.000215427	0.000101955	1.03947E-08
Apr 23, 2007	28	0.033168222	0.032625292	0.00106441	0.579567526	0.000616897	0.001100131	0.000483234	2.33515E-07
Apr 24, 2007	27	-0.025828241	-0.026371172	0.000695439	0.591395435	0.000411279	0.000667098	0.000255819	6.54432E-08
Apr 25, 2007	26	0.029621912	0.029078982	0.000845587	0.60346473	0.000510282	0.000877458	0.000367176	1.34818E-07
Apr 26, 2007	25	-0.006542523	-0.007085454	5.02037E-05	0.615780337	3.09144E-05	4.28046E-05	1.18902E-05	1.41377E-10
Apr 27, 2007	24	0.012833501	0.01229057	0.000151058	0.628347282	9.4917E-05	0.000164699	6.97818E-05	4.8695E-09
Apr 30, 2007	23	0	-0.000542931	2.94774E-07	0.641170696	1.89E-07	0	-1.89E-07	3.57211E-14
May 01, 2007	22	-0.016120884	-0.016663815	0.000277683	0.654255812	0.000181676	0.000259883	7.82074E-05	6.11639E-09
May 02, 2007	21	-0.016223084	-0.016766014	0.000281099	0.667607972	0.000187664	0.000263188	7.55244E-05	5.70393E-09
May 03, 2007	20	-0.003948192	-0.004491123	2.01702E-05	0.681232624	1.37406E-05	1.55882E-05	1.84763E-06	3.41375E-12
May 04, 2007	19	-0.007834217	-0.008377147	7.01766E-05	0.695135331	4.87822E-05	6.1375E-05	1.25927E-05	1.58577E-10
May 07, 2007	18	-0.01541117	-0.0159541	0.000254533	0.709321766	0.000180546	0.000237504	5.69581E-05	3.24423E-09
May 08, 2007	17	0.014864841	0.01432191	0.000205117	0.723797721	0.000148463	0.000220963	7.25002E-05	5.25628E-09
May 09, 2007	16	-0.007735179	-0.008278109	6.85271E-05	0.738569103	5.0612E-05	5.9833E-05	9.22099E-06	8.50267E-11
May 10, 2007	15	0.025393529	0.024850599	0.000617552	0.753641941	0.000465413	0.000644831	0.000179418	3.21908E-08
May 11, 2007	14	0.010574762	0.010031831	0.000100638	0.769022389	7.73926E-05	0.000111826	3.4433E-05	1.18563E-09
May 14, 2007	13	-0.008268698	-0.008811629	7.76448E-05	0.784716724	6.09292E-05	6.83714E-05	7.44219E-06	5.53863E-11
May 15, 2007	12	0.012456908	0.011913978	0.000141943	0.800731351	0.000113658	0.000155175	4.15165E-05	1.72362E-09
May 16, 2007	11	-0.012349779	-0.01289271	0.000166222	0.817072807	0.000135815	0.000152517	1.67016E-05	2.78943E-10
May 17, 2007	10	0.036652629	0.036109699	0.00130391	0.833747762	0.001087132	0.001343415	0.000256283	6.56809E-08
May 18, 2007	9	-0.011163438	-0.011706369	0.000137039	0.850763023	0.000116588	0.000124622	8.03458E-06	6.45544E-11
May 21, 2007	8	0.018468749	0.017925818	0.000321335	0.868125533	0.000278959	0.000341095	6.21356E-05	3.86083E-09
May 22, 2007	7	-0.022654607	-0.023197537	0.000538126	0.885842381	0.000476695	0.000513231	3.65366E-05	1.33492E-09
May 23, 2007	6	0.013074805	0.012531875	0.000157048	0.903920797	0.000141959	0.000170951	2.89917E-05	8.40518E-10
May 24, 2007	5	-0.00165743	-0.002200361	4.84159E-06	0.92236816	4.46573E-06	2.74708E-06	-1.71865E-06	2.95376E-12
May 25, 2007	4	0.005170375	0.004627444	2.14132E-05	0.941192	2.0154E-05	2.67328E-05	6.57881E-06	4.32807E-11
May 29, 2007	3	-0.036820419	-0.03736335	0.00139602	0.9604	0.001340738	0.001355743	1.50057E-05	2.25172E-10
May 30, 2007	2	0.003471762	0.002928831	8.57805E-06	0.98	8.40649E-06	1.20531E-05	3.64664E-06	1.3298E-11

Tanggal	*Day Number*	*Return*	$R_{WTISpot} - R_{Mean}$	$(R_{WTISpot} - R_{Mean})^2$	$\lambda^{(i-1)}$	$(R_{WTISpot} - R_{Mean})^2 \times \lambda^{(i-1)}$	Actual Var	Error	Error Square
		(a)	(b)	(c) = (b)^2	(d)	(e) = (c) x (d)	(f) = (a)^2	(g) = (f) -(e)	(h) = (g)^2
May 31, 2007	1	0.003831626	0.003288696	1.08155E-05	1	1.08155E-05	1.46814E-05	3.86584E-06	1.49447E-11

Mean Return	0.000542931	Sum	0.017216778	Mean S.E	3.8917E-06
		Variance	0.000344336	RMSE 0.98	0.001972738
		Stdev EWMA	0.018556281	RMSE 0.99	0.001967056
		Stdev Normal	0.0261527	RMSE 0.97	0.001974223
				RMSE 0.96	0.001974877
				RMSE 0.95	0.001975216
				RMSE 0.94	0.001975413
				RMSE 0.93	0.001975540
				RMSE 0.92	0.001975628
				RMSE 0.91	0.001975693
				RMSE 0.90	0.001975743
				RMSE 0.89	0.001975784
				RMSE 0.88	0.001975818
				RMSE 0.87	0.001975846
				RMSE 0.86	0.001975871
				RMSE 0.85	0.001975893
				RMSE 0.84	0.001975912
				RMSE 0.83	0.001975930
				RMSE 0.82	0.001975946
				RMSE 0.81	0.001975960
				RMSE 0.80	0.001975974
				RMSE 0.79	0.001975986
				RMSE 0.78	0.001975998
				RMSE 0.77	0.001976009
				RMSE 0.76	0.001976019
				RMSE 0.75	0.001976029

Lampiran 10 : Rekapitulasi Model ARCH/GARCH WTI Spot

No	Jenis ARCH/GARCH	Software	Nilai AIC	Nilai SIC	Log Likelihood	Variabel			
						Jenis	Nilai	Prob	Signifikansi Pada α = 1%
1	ARCH(1)	Eviews	-4.605542	-4.593611	4268.732	C	0.000509	0.0000	Ya
						ARCH(1)	0.152542	0.0000	Ya
2	ARCH(2)	Eviews	-4.611632	-4.596718	4275.371	C	0.000472	0.0000	Ya
						ARCH(1)	0.142786	0.0000	Ya
						ARCH(2)	0.070592	0.0004	Ya
3	ARCH(3)	Eviews	-4.615264	-4.597367	4279.734	C	0.000435	0.0000	Ya
						ARCH(1)	0.12896	0.0000	Ya
						ARCH(2)	0.062942	0.0008	Ya
						ARCH(3)	0.08723	0.0001	Ya
4	GARCH (1,1)	Eviews	-4.628222	-4.613308	4290.734	C	4.22E-05	0.0000	Ya
						ARCH(1)	0.071111	0.0000	Ya
						GARCH(1)	0.858687	0.0000	Ya
5	GARCH (1,2)	Eviews	-4.628747	-4.610851	4292.22	C	4.71E-05	0.0000	Ya
						ARCH(1)	0.089485	0.0000	Ya
						GARCH(1)	0.375276	0.0043	Ya
						GARCH(2)	0.456751	0.0002	Ya
6	GARCH (2,1)	Eviews	-4.632245	-4.614349	4295.459	C	8.26E-06	0.0105	Tidak
						ARCH(1)	0.119629	0.0000	Ya
						ARCH(2)	-0.095373	0.0000	Ya
						GARCH(1)	0.961637	0.0000	Ya
7	GARCH (2,2)	Eviews	-4.633021	-4.612142	4297.178	C	2.23E-06	0.0793	Tidak
						ARCH(1)	0.119927	0.0000	Ya
						ARCH(2)	-0.11122	0.0000	Ya
						GARCH(1)	1,425,829	0.0000	Ya
						GARCH(2)	-0.438475	0.0005	Ya
8	GARCH (1,3)	Eviews	-4.631502	-4.610623	4295.771	C	2.15E-05	0.0017	Ya
						ARCH(1)	0.067068	0.0000	Ya
						GARCH(1)	0.795526	0.0000	Ya
						GARCH(2)	-0.716973	0.0000	Ya
						GARCH(3)	0.81829	0.0000	Ya
9	GARCH (2,3)	Eviews	-4.632504	-4.608642	4297.698	C	3.37E-06	0.0729	Tidak
						ARCH(1)	0.114588	0.0000	Ya
						ARCH(2)	-0.104315	0.0000	Ya
						GARCH(1)	1,335,698	0.0000	Ya
						GARCH(2)	-0.290132	0.1963	Tidak
						GARCH(3)	-0.061699	0.4739	Tidak
10	GARCH (3,3)	Eviews	-4.633437	-4.606592	4299.562	C	2.81E-06	0.2119	Tidak
						ARCH(1)	0.115844	0.0000	Ya
						ARCH(2)	-0.044532	0.0866	Tidak
						ARCH(3)	-0.061181	0.0163	Tidak
						GARCH(1)	0.747493	0.0000	Ya
						GARCH(2)	0.791046	0.0000	Ya
						GARCH(3)	-0.553526	0.0000	Ya
11	GARCH (3,1)	Eviews	-4.632359	-4.61148	4296.564	C	7.18E-06	0.0157	Tidak
						ARCH(1)	0.118244	0.0000	Ya
						ARCH(2)	-0.070773	0.0021	Ya
						ARCH(3)	-0.026434	0.0902	Tidak
						GARCH(1)	0.966601	0.0000	Ya
12	GARCH (3,2)	Eviews	-4.630233	-4.606371	4295.596	C	1.67E-05	0.0132	Tidak
						ARCH(1)	0.120541	0.0000	Ya
						ARCH(2)	0.013564	0.5234	Tidak
						ARCH(3)	-0.085252	0.0019	Ya
						GARCH(1)	0.024942	0.8642	Tidak
						GARCH(2)	0.89786	0.0000	Ya
13	GARCH (1,4)	Eviews	-4.630237	-4.606375	4295.6	C	3.90E-05	0.0004	Ya
						ARCH(1)	0.104491	0.0000	Ya
						GARCH(1)	0.213572	0.0036	Ya
						GARCH(2)	0.129602	0.1989	Tidak
						GARCH(3)	-0.038074	0.7402	Tidak
						GARCH(4)	0.525146	0.0000	Ya
14	GARCH M (1,1)	Eviews	-4.627069	-4.609173	4290.666	C	4.44E-05	0.0000	Ya
						ARCH(1)	0.072891	0.0000	Ya
						GARCH(1)	0.853422	0.0000	Ya
15	Student GARCH (1,1)	OxMetrics	-4.68857	-4.670682	4349.961	C	1.75474E-05	0.0804	Tidak
						ARCH(1)	0.036037	0.0162	Tidak
						GARCH(1)	0.933375	0.0000	Ya
						Student(DF)	6,285,395	0.0000	Ya
16	Skewed Student GARCH (1,1)	OxMetrics	-4.691109	-4.670239	4353.312	C	1.55409E-05	0.0589	Tidak
						ARCH(1)	0.033798	0.0089	Ya
						GARCH(1)	0.938862	0.0000	Ya
						Asymmetry	-0.086375	0.0118	Tidak
17	Skewed Student GARCH (1,2)	OxMetrics	-4.690244	-4.666392	4353.511	C	1.90721E-05	0.0888	Tidak

No	Jenis ARCH/GARCH	Software	Nilai AIC	Nilai SIC	Log Likelihood	Variabel			
						Jenis	Nilai	Prob	Signifikansi Pada α = 1%
						ARCH(1)	0.041789	0.0381	Tidak
						GARCH(1)	0.67488	0.1174	Tidak
						GARCH(2)	0.249669	0.5399	Tidak
						Asymmetry	-0.085369	0.0126	Tidak
18	Skewed Student GARCH (1,3)	OxMetrics	-4.691753	-4.664921	4355.91	C	2.45502E-05	0.0111	Tidak
						ARCH(1)	0.057137	0.0003	Ya
						GARCH(1)	0.813634	0.0000	Ya
						GARCH(2)	-0.688491	0.0000	Ya
						GARCH(3)	0.773966	0.0000	Ya
						Asymmetry	-0.083333	0.0139	Tidak

Lampiran 11 : Rekapitulasi Model ARCH/GARCH Heating Oil Spot

No	Jenis ARCH/GARCH	Software	Nilai AIC	Nilai SIC	Log Likelihood	Variabel			
						Jenis	Nilai	Prob	Signifikansi Pada α = 1%
1	ARCH(1)	Eviews	-4.331876	-4.319946	4015.318	C	0.000564	0.0000	Ya
						ARCH(1)	0.371283	0.0000	Ya
2	ARCH(2)	Eviews	-4.404449	-4.389535	4083.519	C	0.000463	0.0000	Ya
						ARCH(1)	0.152275	0.0000	Ya
						ARCH(2)	0.288474	0.0000	Ya
3	ARCH(3)	Eviews	-4.415691	-4.397795	4094.93	C	0.000418	0.0000	Ya
						ARCH(1)	0.1071	0.0000	Ya
						ARCH(2)	0.265195	0.0000	Ya
						ARCH(3)	0.121904	0.0000	Ya
4	GARCH (1,1)	Eviews	-4.463792	-4.448878	4138.472	C	4.13E-05	0.0000	Ya
						ARCH(1)	0.119448	0.0000	Ya
						GARCH(1)	0.826385	0.0000	Ya
5	GARCH (1,2)	Eviews	-4.464105	-4.446209	4139.761	C	3.02E-05	0.0000	Ya
						ARCH(1)	0.084479	0.0000	Ya
						GARCH(1)	1,234,300	0.0000	Ya
						GARCH(2)	-0.357827	0.0000	Ya
6	GARCH (2,1)	Eviews	-4.463807	-4.445911	4139.485	C	4.88E-05	0.0000	Ya
						ARCH(1)	0.084627	0.0003	Ya
						ARCH(2)	0.054083	0.0605	Tidak
						GARCH(1)	0.798036	0.0000	Ya
7	GARCH (2,2)	Eviews	-4.46303	-4.442151	4139.766	C	2.88E-05	0.0488	Tidak
						ARCH(1)	0.086308	0.0004	Ya
						ARCH(2)	-0.00575	0.9215	Tidak
						GARCH(1)	1,260,311	0.0000	Ya
						GARCH(2)	-0.378121	0.0799	Tidak
8	GARCH (1,3)	Eviews	-4.463027	-4.442148	4139.763	C	3.05E-05	0.0007	Ya
						ARCH(1)	0.08541	0.0005	Ya
						GARCH(1)	1,212,957	0.0060	Ya
						GARCH(2)	-0.325403	0.6166	Tidak
						GARCH(3)	-0.012445	0.9593	Tidak
9	GARCH (2,3)	Eviews	-4.460732	-4.43687	4138.638	C	1.55E-05	0.5621	Tidak
						ARCH(1)	0.088505	0.0000	Ya
						ARCH(2)	-0.055393	0.4067	Tidak
						GARCH(1)	1,889,613	0.0015	Ya
						GARCH(2)	-1,214,881	0.0803	Tidak
						GARCH(3)	0.270758	0.1714	Tidak
10	GARCH (3,3)	Eviews	-4.46314	-4.436295	4141.868	C	7.42E-05	0.0000	Ya
						ARCH(1)	0.080912	0.0006	Ya
						ARCH(2)	0.057289	0.0438	Tidak
						ARCH(3)	0.04352	0.2978	Tidak
						GARCH(1)	0.362258	0.0010	Ya
						GARCH(2)	0.737099	0.0000	Ya
						GARCH(3)	-0.3758	0.0000	Ya
11	GARCH (3,1)	Eviews	-4.462786	-4.441906	4139.539	C	5.02E-05	0.0000	Ya
						ARCH(1)	0.084256	0.0003	Ya
						ARCH(2)	0.046204	0.1809	Tidak
						ARCH(3)	0.012008	0.6514	Tidak
						GARCH(1)	0.792521	0.0000	Ya
12	GARCH (3,2)	Eviews	-4.461964	-4.438102	4139.779	C	2.65E-05	0.4216	Tidak
						ARCH(1)	0.084937	0.0004	Ya
						ARCH(2)	-0.003467	0.9582	Tidak
						ARCH(3)	-0.007281	0.8871	Tidak
						GARCH(1)	1,299,582	0.0354	Tidak
						GARCH(2)	-0.408047	0.3994	Tidak
13	GARCH (1,4)	Eviews	-4.465024	-4.441162	4142.612	C	3.42E-05	0.0000	Ya
						ARCH(1)	0.081413	0.0000	Ya
						GARCH(1)	1,061,872	0.0000	Ya
						GARCH(2)	0.42961	0.0000	Ya
						GARCH(3)	-0.944479	0.0000	Ya
						GARCH(4)	0.327836	0.0000	Ya
14	GARCH M (1,1)	Eviews	-4.465753	-4.447857	4141.287	C	4.43E-05	0.0000	Ya
						ARCH(1)	0.121476	0.0000	Ya
						GARCH(1)	0.819991	0.0000	Ya
15	Skewed Student GARCH (1,1)	OxMetrics	-4.483753	-4.462883	4161.197	C	5.47294E-05	0.0109	Tidak
						ARCH(1)	0.106599	0.0000	Ya
						GARCH(1)	0.816731	0.0000	Ya
						Asymmetry	0.029556	0.3750	Tidak
16	Student GARCH (1,1)	OxMetrics	-4.484413	-4.466524	4160.809	C	5.58052E-05	0.0103	Tidak
						ARCH(1)	0.107144	0.0000	Ya
						GARCH(1)	0.814412	0.0000	Ya
						Student(DF)	9.635674	0.0000	Ya

No	Jenis ARCH/GARCH	Software	Nilai AIC	Nilai SIC	Log Likelihood	Variabel			
						Jenis	Nilai	Prob	Signifikansi Pada α = 1%
17	Student GARCH (1,2)	OxMetrics	-4.485035	-4.464165	4162.385	C	4.11319E-05	0.0013	Ya
						ARCH(1)	0.072686	0.0000	Ya
						GARCH(1)	1,324,755	0.0000	Ya
						GARCH(2)	-0.453877	0.0000	Ya
						Student(DF)	9,338,193	0.0000	Ya
18	Student GARCH (1,3)	OxMetrics	-4.484036	-4.460185	4162.46	C	0.000031	0.0013	Ya
						ARCH(1)	0.049729	0.0000	Ya
						GARCH(1)	1.940576	0.0000	Ya
						GARCH(2)	-1.411937	0.0000	Ya
						GARCH(3)	0.379519	0.0000	Ya
						Student(DF)	9.098447	0.0000	Ya
19	Student GARCH (1,4)	OxMetrics	-4.485234	-4.458401	4164.569	C	3.82914E-05	0.0142	Tidak
						ARCH(1)	0.068653	0.0016	Ya
						GARCH(1)	1,111,870	0.0003	Ya
						GARCH(2)	0.38089	0.1559	Tidak
						GARCH(3)	-0.971387	0.0006	Ya
						GARCH(4)	0.357286	0.1338	Tidak
						Student(DF)	9,837,946	0.0000	Ya

Lampiran 12 : Rekapitulasi Model ARCH/GARCH Propane Spot

No	Jenis ARCH/GARCH	Software	Nilai AIC	Nilai SIC	Log Likelihood	Variabel			
						Jenis	Nilai	Prob	Signifikansi Pada α = 1%
1	ARCH(1)	Eviews	-4.695191	-4.68326	4351.747	C	0.000386	0.0000	Ya
						ARCH(1)	0.437124	0.0000	Ya
2	ARCH(2)	Eviews	-4.773747	-4.758833	4425.489	C	0.000294	0.0000	Ya
						ARCH(1)	0.301643	0.0000	Ya
						ARCH(2)	0.276287	0.0000	Ya
3	ARCH(3)	Eviews	-4.798228	-4.780331	4449.159	C	0.000251	0.0000	Ya
						ARCH(1)	0.253381	0.0000	Ya
						ARCH(2)	0.213044	0.0000	Ya
						ARCH(3)	0.188594	0.0000	Ya
4	GARCH (1,1)	Eviews	-4.834346	-4.819432	4481.604	C	5.28E-05	0.0000	Ya
						ARCH(1)	0.194965	0.0000	Ya
						GARCH(1)	0.722032	0.0000	Ya
5	GARCH (1,2)	Eviews	-4.833395	-4.815499	4481.724	C	5.55E-05	0.0000	Ya
						ARCH(1)	0.203119	0.0000	Ya
						GARCH(1)	0.652235	0.0000	Ya
						GARCH(2)	0.056578	0.6284	Tidak
6	GARCH (2,1)	Eviews	-4.833527	-4.815631	4481.846	C	5.00E-05	0.0000	Ya
						ARCH(1)	0.211054	0.0000	Ya
						ARCH(2)	-0.029688	0.3396	Tidak
						GARCH(1)	0.738724	0.0000	Ya
7	GARCH (2,2)	Eviews	-4.83252	-4.811641	4481.914	C	9.39E-05	0.0000	Ya
						ARCH(1)	0.184703	0.0000	Ya
						ARCH(2)	0.165305	0.0000	Ya
						GARCH(1)	-0.056521	0.7895	Tidak
						GARCH(2)	0.559730	0.0004	Ya
8	GARCH (1,3)	Eviews	-4.839498	-4.818619	4488.375	C	7.00E-05	0.0000	Ya
						ARCH(1)	0.256963	0.0000	Ya
						GARCH(1)	0.513992	0.0000	Ya
						GARCH(2)	-0.306788	0.0000	Ya
						GARCH(3)	0.421775	0.0000	Ya
9	GARCH (2,3)	Eviews	-4.84654	-4.822678	4495.896	C	9.28E-05	0.0000	Ya
						ARCH(1)	0.229785	0.0000	Ya
						ARCH(2)	0.111278	0.0003	Ya
						GARCH(1)	0.271787	0.0000	Ya
						GARCH(2)	-0.253034	0.0000	Ya
						GARCH(3)	0.494157	0.0000	Ya
10	GARCH (3,3)	Eviews	-4.845127	-4.818282	4495.587	C	9.08E-05	0.0000	Ya
						ARCH(1)	0.213832	0.0000	Ya
						ARCH(2)	0.102792	0.0004	Ya
						ARCH(3)	0.021376	0.3269	Tidak
						GARCH(1)	0.280727	0.0000	Ya
						GARCH(2)	-0.287174	0.0000	Ya
						GARCH(3)	0.519912	0.0000	Ya
11	GARCH (3,1)	Eviews	-4.833772	-4.812892	4483.072	C	4.25E-05	0.0000	Ya
						ARCH(1)	0.2132	0.0000	Ya
						ARCH(2)	0.001849	0.9613	Tidak
						ARCH(3)	-0.056918	0.0343	Tidak
						GARCH(1)	0.774032	0.0000	Ya
12	GARCH (3,2)	Eviews	-4.83376	-4.809898	4484.061	C	6.71E-05	0.0000	Ya
						ARCH(1)	0.218595	0.0000	Ya
						ARCH(2)	0.130647	0.0000	Ya
						ARCH(3)	-0.102411	0.0004	Ya
						GARCH(1)	0.140029	0.1981	Tidak
						GARCH(2)	0.503934	0.0000	Ya
13	GARCH (1,4)	Eviews	-4.845631	-4.82177	4495.055	C	6.57E-05	0.0000	Ya
						ARCH(1)	0.230307	0.0000	Ya
						GARCH(1)	0.647013	0.0000	Ya
						GARCH(2)	-0.405949	0.0000	Ya
						GARCH(3)	0.595534	0.0000	Ya
						GARCH(4)	-0.171412	0.0000	Ya
14	GARCH M (1,1)	Eviews	-4.840888	-4.822991	4488.662	C	5.27E-05	0.0000	Ya
						ARCH(1)	0.18397	0.0000	Ya
						GARCH(1)	0.727756	0.0000	Ya
15	Student GARCH (1,1)	OxMetrics	-5.009054	-4.991165	4646.888	C	4.30938E-05	0.0010	Ya
						ARCH(1)	0.200316	0.0000	Ya
						GARCH(1)	0.742181	0.0000	Ya
						Student(DF)	3,921,105	0.0000	Ya
16	Student GARCH (1,3)	OxMetrics	-5.010737	-4.986886	4650.448	C	5.79094E-05	0.0000	Ya
						ARCH(1)	0.270259	0.0000	Ya
						GARCH(1)	0.628411	0.0000	Ya
						GARCH(2)	-0.414125	0.0021	Ya
						GARCH(3)	0.437618	0.0000	Ya
						Student(DF)	3,945,914	0.0000	Ya

No	Jenis ARCH/GARCH	Software	Nilai AIC	Nilai SIC	Log Likelihood	Variabel			
						Jenis	Nilai	Prob	Signifikansi Pada α = 1%
17	Student GARCH (2,3)	OxMetrics	-5.013486	-4.986654	4653.995	C	8.62854E-05	0.0000	Ya
						ARCH(1)	0.232968	0.0001	Ya
						ARCH(2)	0.163063	0.0017	Ya
						GARCH(1)	0.229381	0.0000	Ya
						GARCH(2)	-0.221293	0.0000	Ya
						GARCH(3)	0.483041	0.0000	Ya
						Student(DF)	3.969313	0.0000	Ya
18	Student GARCH (1,4)	OxMetrics	-5.012633	-4.9858	4653.205	C	4.63334E-05	0.0000	Ya
						ARCH(1)	0.220042	0.0000	Ya
						GARCH(1)	0.771667	0.0000	Ya
						GARCH(2)	-0.438702	0.0000	Ya
						GARCH(3)	0.641215	0.0000	Ya
						GARCH(4)	-0.254902	0.0000	Ya
						Student(DF)	3,984,569	0.0000	Ya
19	Skewed Student GARCH (1,1)	OxMetrics	-5.008933	-4.988063	4647.776	C	4.14393E-05	0.0008	Ya
						ARCH(1)	0.197959	0.0000	Ya
						GARCH(1)	0.748292	0.0000	Ya
						Asymmetry	0.037439	0.1236	Tidak

Lampiran 13 : Rekapitulasi Model ARCH/GARCH WTI Future

No	Jenis ARCH/GARCH	Software	Nilai AIC	Nilai SIC	Log Likelihood	Variabel			
						Jenis	Nilai	Prob	Signifikansi Pada α = 1%
1	ARCH(1)	Eviews	-4.672747	-4.660789	4319.281	C	0.000509	0.0000	Ya
						ARCH(1)	0.07316	0.0000	Ya
2	ARCH(2)	Eviews	-4.672704	-4.657758	4320.242	C	0.000493	0.0000	Ya
						ARCH(1)	0.071203	0.0000	Ya
						ARCH(2)	0.031022	0.0782	Tidak
3	ARCH(3)	Eviews	-4.692056	-4.67412	4339.114	C	0.000416	0.0000	Ya
						ARCH(1)	0.051187	0.0018	Ya
						ARCH(2)	0.022008	0.2254	Tidak
						ARCH(3)	0.180614	0.0000	Ya
4	GARCH (1,1)	Eviews	-4.70331	-4.688363	4348.507	C	1.83E-05	0.0005	Ya
						ARCH(1)	0.045323	0.0000	Ya
						GARCH(1)	0.921551	0.0000	Ya
5	GARCH (1,2)	Eviews	-4.704584	-4.686648	4350.684	C	2.37E-05	0.0010	Ya
						ARCH(1)	0.066924	0.0000	Ya
						GARCH(1)	0.152995	0.1721	Tidak
						GARCH(2)	0.737079	0.0000	Ya
6	GARCH (2,1)	Eviews	-4.702316	-4.68438	4348.589	C	1.51E-05	0.0018	Ya
						ARCH(1)	0.050953	0.0007	Ya
						ARCH(2)	-0.011438	0.4956	Tidak
						GARCH(1)	0.933144	0.0000	Ya
7	GARCH (2,2)	Eviews	-4.703654	-4.682729	4350.824	C	2.08E-05	0.0073	Ya
						ARCH(1)	0.073671	0.0000	Ya
						ARCH(2)	-0.013374	0.5428	Tidak
						GARCH(1)	0.219984	0.2007	Tidak
						GARCH(2)	0.682102	0.0000	Ya
8	GARCH (1,3)	Eviews	-4.704061	-4.683136	4351.2	C	2.68E-05	0.0012	Ya
						ARCH(1)	0.078532	0.0000	Ya
						GARCH(1)	-0.070862	0.6769	Tidak
						GARCH(2)	0.668029	0.0000	Ya
						GARCH(3)	0.275764	0.1151	Tidak
9	GARCH (2,3)	Eviews	-4.703863	-4.679949	4352.018	C	4.67E-05	0.0030	Ya
						ARCH(1)	0.078036	0.0000	Ya
						ARCH(2)	0.049423	0.0078	Ya
						GARCH(1)	-0.680955	0.0000	Ya
						GARCH(2)	0.752887	0.0000	Ya
						GARCH(3)	0.716193	0.0000	Ya
10	GARCH (3,3)	Eviews	-4.705119	-4.678215	4354.177	C	7.19E-05	0.0032	Ya
						ARCH(1)	0.048328	0.0028	Ya
						ARCH(2)	-0.008256	0.7181	Tidak
						ARCH(3)	0.117226	0.0000	Ya
						GARCH(1)	0.123666	0.5352	Tidak
						GARCH(2)	0.380426	0.0030	Ya
						GARCH(3)	0.211709	0.2253	Tidak
11	GARCH (3,1)	Eviews	-4.706035	-4.685109	4353.023	C	4.85E-05	0.0000	Ya
						ARCH(1)	0.044745	0.0055	Ya
						ARCH(2)	-0.038133	0.0922	Tidak
						ARCH(3)	0.095826	0.0000	Ya
						GARCH(1)	0.812155	0.0000	Ya
12	GARCH (3,2)	Eviews	-4.705891	-4.681976	4353.891	C	5.91E-05	0.0002	Ya
						ARCH(1)	0.045692	0.0048	Ya
						ARCH(2)	-0.021982	0.3270	Tidak
						ARCH(3)	0.10498	0.0000	Ya
						GARCH(1)	0.407682	0.0362	Tidak
						GARCH(2)	0.35937	0.0326	Tidak
13	GARCH (1,4)	Eviews	-4.704479	-4.680564	4352.586	C	3.31E-05	0.0013	Ya
						ARCH(1)	0.07835	0.0000	Ya
						GARCH(1)	-0.028952	0.796	Tidak
						GARCH(2)	0.97588	0.0000	Ya
						GARCH(3)	0.267573	0.0244	Tidak
						GARCH(4)	-0.352198	0.0360	Tidak
14	GARCH M (1,1)	Eviews	-4.702252	-4.684316	4348.53	C	1.61E-05	0.0008	Ya
						ARCH(1)	0.042366	0.0000	Ya
						GARCH(1)	0.928423	0.0000	Ya
15	Student GARCH (1,1)	OxMetrics	-4.741104	-4.723176	4386.78	C	1.18762E-05	0.0546	Tidak
						ARCH(1)	0.026877	0.0042	Ya
						GARCH(1)	0.950388	0.0000	Ya
						Student(DF)	8,394,405	0.0000	Ya
16	Skewed Student GARCH (1,1)	OxMetrics	-4.743715	-4.722799	4390.193	C	1.05818E-05	0.0319	Tidak
						ARCH(1)	0.026197	0.0011	Ya
						GARCH(1)	0.953411	0.0000	Ya
						Asymmetry	-0.08905	0.0077	Ya
17	Skewed Student GARCH (1,2)	OxMetrics	-4.743059	-4.719154	4390.586	C	5.9711E-06	0.1129	Tidak

No	Jenis ARCH/GARCH	Software	Nilai AIC	Nilai SIC	Log Likelihood	Variabel			
						Jenis	Nilai	Prob	Signifikansi Pada α = 1%
						ARCH(1)	0.014697	0.0393	Tidak
						GARCH(1)	1.452956	0.0000	Ya
						GARCH(2)	-0.4791	0.0111	Tidak
						Asymmetry	-0.092624	0.0056	Ya
18	Skewed Student GARCH (1,3)	OxMetrics	-4.742069	-4.715177	4390.672	C	9.2695E-06	0.1417	Tidak
						ARCH(1)	0.02289	0.0717	Tidak
						GARCH(1)	0.776257	0.009	Ya
						GARCH(2)	0.555565	0.0262	Tidak
						GARCH(3)	-0.372533	0.0077	Ya
						Asymmetry	-0.090704	0.0068	Ya
19	Skewed Student GARCH (2,3)	OxMetrics	-4.74142	-4.71154	4391.072	C	3.53383E-05	0.0267	Tidak
						ARCH(1)	0.045681	0.0023	Ya
						ARCH(2)	0.048335	0.0007	Ya
						GARCH(1)	-0.819031	0.0000	Ya
						GARCH(2)	0.888567	0.0000	Ya
						GARCH(3)	0.768474	0.0000	Ya
						Asymmetry	-0.088766	0.0094	Ya

Lampiran 14 : Rekapitulasi Model ARCH/GARCH Heating Oil Future

No	Jenis ARCH/GARCH	Software	Nilai AIC	Nilai SIC	Log Likelihood	Variabel			
						Jenis	Nilai	Prob	Signifikansi Pada α = 1%
1	ARCH(1)	Eviews	-4.476339	-4.464382	4137.899	C	0.000572	0.0000	Ya
						ARCH(1)	0.169671	0.0000	Ya
2	ARCH(2)	Eviews	-4.479657	-4.46471	4141.963	C	0.000533	0.0000	Ya
						ARCH(1)	0.170075	0.0000	Ya
						ARCH(2)	0.059759	0.0088	Ya
3	ARCH(3)	Eviews	-4.480961	-4.463025	4144.167	C	0.000505	0.0000	Ya
						ARCH(1)	0.151075	0.0000	Ya
						ARCH(2)	0.05583	0.0186	Tidak
						ARCH(3)	0.066313	0.0004	Ya
4	GARCH (1,1)	Eviews	-4.525479	-4.510532	4184.279	C	3.12E-05	0.0000	Ya
						ARCH(1)	0.079509	0.0000	Ya
						GARCH(1)	0.875870	0.0000	Ya
5	GARCH (1,2)	Eviews	-4.525208	-4.507272	4185.03	C	4.12E-05	0.0000	Ya
						ARCH(1)	0.101149	0.0000	Ya
						GARCH(1)	0.502478	0.0042	Ya
						GARCH(2)	0.336839	0.0361	Tidak
6	GARCH (2,1)	Eviews	-4.524779	-4.506843	4184.633	C	2.89E-05	0.0000	Ya
						ARCH(1)	0.096653	0.0000	Ya
						ARCH(2)	-0.024568	0.0958	Tidak
						GARCH(1)	0.886269	0.0000	Ya
7	GARCH (2,2)	Eviews	-4.52414	-4.503215	4185.043	C	3.95E-05	0.1155	Tidak
						ARCH(1)	0.103573	0.0000	Ya
						ARCH(2)	-0.006867	0.9078	Tidak
						GARCH(1)	0.542780	0.4273	Tidak
						GARCH(2)	0.303377	0.6105	Tidak
8	GARCH (1,3)	Eviews	-4.524674	-4.503749	4185.537	C	5.02E-05	0.0000	Ya
						ARCH(1)	0.124031	0.0000	Ya
						GARCH(1)	0.304988	0.0322	Tidak
						GARCH(2)	0.142462	0.4194	Tidak
						GARCH(3)	0.355485	0.0038	Ya
9	GARCH (2,3)	Eviews	-4.528194	-4.504279	4189.787	C	8.97E-05	0.0000	Ya
						ARCH(1)	0.098405	0.0000	Ya
						ARCH(2)	0.113422	0.0000	Ya
						GARCH(1)	-0.781153	0.0000	Ya
						GARCH(2)	0.783280	0.0000	Ya
						GARCH(3)	0.654552	0.0000	Ya
10	GARCH (3,3)	Eviews	-4.527299	-4.500395	4189.961	C	2.96E-05	0.0000	Ya
						ARCH(1)	0.09143	0.0000	Ya
						ARCH(2)	-0.146464	0.0000	Ya
						ARCH(3)	0.115775	0.0000	Ya
						GARCH(1)	1,806,092	0.0000	Ya
						GARCH(2)	-1,280,577	0.0000	Ya
						GARCH(3)	0.371416	0.0084	Ya
11	GARCH (3,1)	Eviews	-4.526301	-4.505375	4187.039	C	4.03E-05	0.0000	Ya
						ARCH(1)	0.092850	0.0000	Ya
						ARCH(2)	-0.061301	0.0073	Ya
						ARCH(3)	0.063368	0.0016	Ya
						GARCH(1)	0.847299	0.0000	Ya
12	GARCH (3,2)	Eviews	-4.526979	-4.503064	4188.665	C	3.02E-05	0.0001	Ya
						ARCH(1)	0.095293	0.0000	Ya
						ARCH(2)	-0.116022	0.0000	Ya
						ARCH(3)	0.085089	0.0000	Ya
						GARCH(1)	1,339,538	0.0000	Ya
						GARCH(2)	-0.446975	0.0002	Ya
13	GARCH (1,4)	Eviews	-4.525783	-4.501868	4187.561	C	4.18E-05	0.0000	Ya
						ARCH(1)	0.092900	0.0000	Ya
						GARCH(1)	0.216795	0.0233	Tidak
						GARCH(2)	0.811381	0.0000	Ya
						GARCH(3)	0.220513	0.1117	Tidak
						GARCH(4)	-0.401783	0.0000	Ya
14	GARCH M (1,1)	Eviews	-4.525976	-4.50804	4185.739	C	3.11E-05	0.0000	Ya
						ARCH(1)	0.077828	0.0000	Ya
						GARCH(1)	0.877286	0.0000	Ya
15	Skewed Student GARCH (1,1)	OxMetrics	-4.570938	-4.550022	4230.547	C	2.33398E-05	0.0426	Tidak
						ARCH(1)	0.043017	0.0047	Ya
						GARCH(1)	0.920297	0.0000	Ya
						Asymmetry	0.029579	0.3774	Tidak
16	Student GARCH (1,1)	OxMetrics	-4.571599	-4.553671	4230.158	C	2.33101E-05	0.0418	Tidak
						ARCH(1)	0.042855	0.0047	Ya
						GARCH(1)	0.920364	0.0000	Ya
						Student(DF)	7,140,203	0.0000	Ya
17	Student GARCH (1,2)	OxMetrics	-4.570798	-4.549882	4230.417	C	1.70539E-05	0.1420	Tidak

No	Jenis ARCH/GARCH	Software	Nilai AIC	Nilai SIC	Log Likelihood	Variabel			
						Jenis	Nilai	Prob	Signifikansi Pada α = 1%
						ARCH(1)	0.030836	0.1424	Tidak
						GARCH(1)	1,279,111	0.0515	Tidak
						GARCH(2)	-0.336729	0.5919	Tidak
						Student(DF)	7,096,933	0.0000	Ya
18	Student GARCH (1,3)	OxMetrics	-4.569834	-4.54593	4230.527	C	3.70549E-05	0.0143	Tidak
						ARCH(1)	0.068886	0.0015	Ya
						GARCH(1)	0.644109	0.0027	Ya
						GARCH(2)	-0.380860	0.1541	Tidak
						GARCH(3)	0.609164	0.0379	Tidak
						Student(DF)	7,134,227	0.0000	Ya

Lampiran 15 : *Output Software* untuk Model ARCH/GARCH

1. WTI Spot

Dependent Variable: WTISPOT
Method: ML - ARCH (Marquardt)
Date: 08/28/08 Time: 09:32
Sample(adjusted): 2 1853
Included observations: 1852 after adjusting endpoints
Convergence achieved after 23 iterations
Variance backcast: ON

	Coefficient	Std. Error	z-Statistic	Prob.
C	0.000834	0.000532	1.569717	0.1165
WTISPOT(-1)	-0.043466	0.022853	-1.901990	0.0572
Variance Equation				
C	2.15E-05	6.85E-06	3.143830	0.0017
ARCH(1)	0.067068	0.008328	8.053061	0.0000
GARCH(1)	0.795526	0.035204	22.59748	0.0000
GARCH(2)	-0.716973	0.045671	-15.69875	0.0000
GARCH(3)	0.818290	0.033817	24.19787	0.0000

R-squared	0.001553	Mean dependent var	0.000496
Adjusted R-squared	-0.001694	S.D. dependent var	0.024636
S.E. of regression	0.024657	Akaike info criterion	-4.631502
Sum squared resid	1.121662	Schwarz criterion	-4.610623
Log likelihood	4295.771	F-statistic	0.478365
Durbin-Watson stat	1.997828	Prob(F-statistic)	0.824846

Sumber : *Return* WTI Spot periode 4 Januari 2000- 31 Mei 2007, diolah dengan Eviews 4.1

2. Heating Oil Spot

```
*******************************
 ** G@RCH( 1) SPECIFICATIONS **
 *******************************
Dependent variable : HEATINGSPOT
Mean Equation : ARMA (1, 0) model.
No regressor in the conditional mean
Variance Equation : GARCH (2, 1) model.
No regressor in the conditional variance
Student distribution, with 9.33819 degrees of freedom.

Strong convergence using numerical derivatives
Log-likelihood = 4162.38
Please wait : Computing the Std Errors ...

 Robust Standard Errors (Sandwich formula)
              Coefficient  Std.Error  t-value  t-prob
Cst(M)           0.000944 0.00053354    1.768  0.0772
AR(1)           -0.036218   0.023813   -1.521  0.1284
Cst(V)           0.411319    0.12784    3.217  0.0013
ARCH(Alpha1)     0.072686   0.016338    4.449  0.0000
GARCH(Beta1)     1.324755    0.12113    10.94  0.0000
GARCH(Beta2)    -0.453877   0.098629   -4.602  0.0000
Student(DF)      9.338193     1.8671    5.001  0.0000

No. Observations :     1853  No. Parameters  :        7
Mean (Y)         :  0.00054  Variance (Y)    :  0.00099
Skewness (Y)     : -1.97452  Kurtosis (Y)    :  44.25663
Log Likelihood   :  4162.385  Alpha[1]+Beta[1]:  0.94356

Warning : To avoid numerical problems, the estimated parameter
Cst(V), and its std.Error have been multiplied by 10^4.

The sample mean of squared residuals was used to start recursion.
The positivity constraint for the GARCH (2,1) is not observed.
This constraint is alpha[L]/[1 - beta(L)] >= 0.
The unconditional variance does not exist and/or is not positive.
The conditions are alpha[0] > 0, alpha[L] + beta[L] < 1 and alpha[i] + beta[i] >= 0.
  => See Doornik & Ooms (2001) for more details.

Estimated Parameters Vector :
 0.000944;-0.036218; 0.411319; 0.072686; 1.324755;-0.453877; 9.338198

Elapsed Time : 1.613 seconds (or 0.0268833 minutes).
```

Sumber : *Return* Heating Oil Spot periode 4 Januari 2000- 31 Mei 2007, diolah dengan OxMetrics 5.00

3. Propane Spot

```
*******************************
 ** G@RCH( 1) SPECIFICATIONS **
 *******************************
Dependent variable : PROPANESPOT
Mean Equation : ARMA (1, 0) model.
No regressor in the conditional mean
Variance Equation : GARCH (3, 2) model.
No regressor in the conditional variance
Student distribution, with 3.96931 degrees of freedom.

Strong convergence using numerical derivatives
Log-likelihood = 4654
Please wait : Computing the Std Errors ...

 Robust Standard Errors (Sandwich formula)
              Coefficient  Std.Error  t-value  t-prob
Cst(M)           0.000958 0.00039694    2.414  0.0159
AR(1)            0.054689   0.024553    2.227  0.0260
Cst(V)           0.862854    0.21179    4.074  0.0000
ARCH(Alpha1)     0.232968   0.060993    3.820  0.0001
ARCH(Alpha2)     0.163063   0.051797    3.148  0.0017
GARCH(Beta1)     0.229381   0.056018    4.095  0.0000
GARCH(Beta2)    -0.221293   0.040835   -5.419  0.0000
GARCH(Beta3)     0.483041   0.070273    6.874  0.0000
Student(DF)      3.969313    0.44973    8.826  0.0000

No. Observations :     1853  No. Parameters  :        9
Mean (Y)         :  0.00049  Variance (Y)    :  0.00083
Skewness (Y)     : -3.90230  Kurtosis (Y)    : 75.43769
Log Likelihood   : 4653.995  Alpha[1]+Beta[1]:  0.88716

Warning : To avoid numerical problems, the estimated parameter
Cst(V), and its std.Error have been multiplied by 10^4.

The sample mean of squared residuals was used to start recursion.
The positivity constraint for the GARCH (3,2) is not observed.
This constraint is alpha[L]/[1 - beta(L)] >= 0.
The unconditional variance does not exist and/or is not positive.
The conditions are alpha[0] > 0, alpha[L] + beta[L] < 1 and alpha[i] + beta[i] >= 0.
  => See Doornik & Ooms (2001) for more details.

Estimated Parameters Vector :
 0.000958; 0.054689; 0.862854; 0.232968; 0.163063; 0.229381;-0.221293; 0.483041; 3.969318

Elapsed Time : 3.835 seconds (or 0.0639167 minutes).
```

Sumber : *Return* Propane Spot periode 4 Januari 2000- 31 Mei 2007, diolah dengan OxMetrics 5.00

4. WTI Future

Dependent Variable: WTIFUTURE
Method: ML - ARCH (Marquardt)
Date: 09/11/08 Time: 19:57
Sample(adjusted): 2 1848
Included observations: 1847 after adjusting endpoints
Convergence achieved after 35 iterations
Variance backcast: ON

	Coefficient	Std. Error	z-Statistic	Prob.
C	0.000837	0.000522	1.603243	0.1089
WTIFUTURE(-1)	-0.014652	0.025345	-0.578114	0.5632
Variance Equation				
C	4.67E-05	1.57E-05	2.967590	0.0030
ARCH(1)	0.078036	0.012600	6.193164	0.0000
ARCH(2)	0.049423	0.018569	2.661605	0.0078
GARCH(1)	-0.680955	0.111361	-6.114816	0.0000
GARCH(2)	0.752887	0.045881	16.40969	0.0000
GARCH(3)	0.716193	0.087221	8.211211	0.0000

R-squared	-0.000136	Mean dependent var	0.000497
Adjusted R-squared	-0.003943	S.D. dependent var	0.023446
S.E. of regression	0.023492	Akaike info criterion	-4.703863
Sum squared resid	1.014920	Schwarz criterion	-4.679949
Log likelihood	4352.018	Durbin-Watson stat	1.989518

Sumber : *Return* WTI Future periode 4 Januari 2000- 31 Mei 2007, diolah dengan Eviews 4.1

5. Heating Oil Future

Dependent Variable: HEATINGFUTURE
Method: ML - ARCH (Marquardt)
Date: 09/14/08 Time: 13:32
Sample(adjusted): 2 1848
Included observations: 1847 after adjusting endpoints
Convergence achieved after 33 iterations
Variance backcast: ON

	Coefficient	Std. Error	z-Statistic	Prob.
C	0.000797	0.000536	1.484894	0.1376
HEATINGFUTURE(-1)	-0.032951	0.026114	-1.261802	0.2070
Variance Equation				
C	8.97E-05	2.17E-05	4.131707	0.0000
ARCH(1)	0.098405	0.012599	7.810514	0.0000
ARCH(2)	0.113422	0.011275	10.05942	0.0000
GARCH(1)	-0.781153	0.059554	-13.11663	0.0000
GARCH(2)	0.783280	0.031387	24.95570	0.0000
GARCH(3)	0.654552	0.056245	11.63744	0.0000
R-squared	0.001717	Mean dependent var		0.000553
Adjusted R-squared	-0.002083	S.D. dependent var		0.026156
S.E. of regression	0.026183	Akaike info criterion		-4.528194
Sum squared resid	1.260761	Schwarz criterion		-4.504279
Log likelihood	4189.787	F-statistic		0.451871
Durbin-Watson stat	2.023681	Prob(F-statistic)		0.869362

Sumber : *Return* Heating Oil Future periode 4 Januari 2000- 31 Mei 2007, diolah dengan Eviews 4.1

Lampiran 16 : Perhitungan Volatilitas WTI Spot Menggunakan Metode ARCH/GARCH Periode 31 Mei 2007-9 Agustus 2007

No	Tanggal	Residual	CondVar1	CondVar2	CondVar3	ARCH(Alpha1)	GARCH(Beta1)	GARCH(Beta2)	GARCH(Beta3)	Constant(V)	CondVar(t+1)	Volatility
1853	May 31, 2007	0.00799	0.000395	0.000423	0.000385	0.067068	0.795526	-0.716973	0.81829	2.15E-05	0.000351776	0.018755705
1854	Jun 01, 2007	0.0161	0.000352	0.000395	0.000423	0.067104	0.795611	-0.717265	0.818524	2.15E-05	0.000381865	0.019541368
1855	Jun 04, 2007	0.01631	0.00038200	0.000352	0.000395	0.067141	0.795799	-0.717477	0.818547	2.15E-05	0.00041413	0.020350183
1856	Jun 05, 2007	-0.00834	0.000413	0.000381	0.000351	0.06711	0.79563	-0.716808	0.818288	2.13E-05	0.000368678	0.019200998
1857	Jun 06, 2007	0.00396	0.000368	0.000413	0.00038	0.067109	0.795179	-0.716531	0.818842	2.11E-05	0.000330011	0.018166202
1858	Jun 07, 2007	0.0138	0.00033	0.000368	0.000412	0.067175	0.795382	-0.717032	0.819206	2.10E-05	0.000369914	0.019233148
1859	Jun 08, 2007	-0.03286	0.000372	0.000332	0.000369	0.067013	0.794331	-0.716215	0.819168	2.13E-05	0.00045364	0.021298827
1860	Jun 11, 2007	0.01529	0.000453	0.000372	0.000331	0.066947	0.794281	-0.716091	0.81932	2.12E-05	0.00040147	0.020036704
1861	Jun 12, 2007	-0.00874	0.000401	0.000453	0.000371	0.066809	0.793998	-0.71606	0.820106	2.09E-05	0.000324281	0.018007796
1862	Jun 13, 2007	0.01107	0.000324	0.000401	0.000452	0.066876	0.794368	-0.716946	0.820808	2.08E-05	0.00036988	0.019232275
1863	Jun 14, 2007	0.02136	0.000371	0.000324	0.000401	0.066905	0.794232	-0.716869	0.820711	2.08E-05	0.000442825	0.021043408
1864	Jun 15, 2007	0.00629	0.000441	0.00037	0.000324	0.06678	0.793986	-0.716302	0.820802	2.06E-05	0.000374298	0.019346783
1865	Jun 18, 2007	0.01427	0.000374	0.000441	0.00037	0.066772	0.793789	-0.716255	0.821122	2.05E-05	0.000318921	0.017858352
1866	Jun 19, 2007	0.00108	0.000317	0.000373	0.00044	0.066857	0.794468	-0.717742	0.822295	2.03E-05	0.000366316	0.019139393
1867	Jun 20, 2007	-0.01026	0.000366	0.000317	0.000373	0.066881	0.794838	-0.717891	0.822264	2.01E-05	0.000397184	0.019929479
1868	Jun 21, 2007	-0.00349	0.000396	0.000366	0.000316	0.066828	0.7944	-0.716961	0.822134	1.99E-05	0.000332683	0.018239599
1869	Jun 22, 2007	0.00631	0.000332	0.000395	0.000365	0.066853	0.794054	-0.717019	0.822917	1.97E-05	0.00030313	0.017410628
1870	Jun 25, 2007	-0.00084	0.000301	0.000331	0.000395	0.066983	0.794857	-0.7185	0.823907	1.94E-05	0.000346319	0.018609648
1871	Jun 26, 2007	-0.01625	0.000346	0.000301	0.000331	0.066983	0.79493	-0.718428	0.82386	1.93E-05	0.000368484	0.019195945
1872	Jun 27, 2007	0.01597	0.000368	0.000346	0.000301	0.066996	0.794802	-0.718219	0.823854	1.93E-05	0.00032835	0.018120434
1873	Jun 28, 2007	0.009	0.000327	0.000367	0.000345	0.067007	0.794637	-0.718483	0.824636	1.91E-05	0.00030519	0.017469689
1874	Jun 29, 2007	0.01179	0.000305	0.000327	0.000367	0.067085	0.79508	-0.719251	0.825097	1.89E-05	0.00033834	0.018394021
1875	Jul 02, 2007	0.00869	0.000337	0.000304	0.000326	0.067175	0.795268	-0.719072	0.824851	1.88E-05	0.000342182	0.018498153
1876	Jul 03, 2007	0.00371	0.000342	0.000336	0.000303	0.067205	0.794715	-0.718185	0.824852	1.86E-05	0.000299938	0.017318705
1877	Jul 05, 2007	0.00486	0.000298	0.00034	0.000336	0.067269	0.794672	-0.718722	0.825857	1.83E-05	0.000289824	0.017024206
1878	Jul 06, 2007	0.01302	0.000288	0.000297	0.00034	0.067363	0.794998	-0.719244	0.826117	1.82E-05	0.000325843	0.018051126
1879	Jul 09, 2007	-0.00941	0.000325	0.000287	0.000296	0.067416	0.795053	-0.718884	0.825915	1.80E-05	0.000320513	0.017902875
1880	Jul 10, 2007	0.00777	0.000319	0.000324	0.000287	0.06746	0.794606	-0.718317	0.826111	1.78E-05	0.000279711	0.016724569
1881	Jul 11, 2007	-0.00354	0.000278	0.000318	0.000323	0.067545	0.794702	-0.719019	0.827191	1.75E-05	0.000277808	0.016667581
1882	Jul 12, 2007	-0.00148	0.000276	0.000276	0.000317	0.067717	0.795423	-0.719928	0.827675	1.72E-05	0.000300558	0.017336606
1883	Jul 13, 2007	0.01734	0.0003	0.000276	0.000276	0.067745	0.79545	-0.720008	0.827667	1.72E-05	0.000305918	0.017490516
1884	Jul 16, 2007	0.00286	0.000305	0.000299	0.000275	0.067779	0.794983	-0.719503	0.828081	1.69E-05	0.000272515	0.016508031
1885	Jul 17, 2007	-0.00189	0.00027	0.000303	0.000298	0.067863	0.795213	-0.720353	0.829215	1.66E-05	0.000260389	0.016136574
1886	Jul 18, 2007	0.01241	0.000259	0.00027	0.000303	0.067976	0.795477	-0.720674	0.829339	1.65E-05	0.000289705	0.017020727
1887	Jul 19, 2007	0.01117	0.000289	0.000259	0.000269	0.068073	0.795402	-0.720322	0.829185	1.63E-05	0.000291152	0.017063175
1888	Jul 20, 2007	-0.00533	0.00029	0.000288	0.000257	0.068089	0.795058	-0.720049	0.829756	1.60E-05	0.000254374	0.015949117
1889	Jul 23, 2007	-0.01289	0.000254	0.000289	0.000287	0.068113	0.795117	-0.720238	0.830097	1.59E-05	0.000259266	0.016101736
1890	Jul 24, 2007	-0.01862	0.00026	0.000255	0.00029	0.068027	0.794893	-0.719927	0.829935	1.60E-05	0.000303357	0.017417153
1891	Jul 25, 2007	0.0299	0.000306	0.000263	0.000257	0.068033	0.79522	-0.721049	0.829771	1.66E-05	0.000344375	0.018557337
1892	Jul 26, 2007	-0.00984	0.000344	0.000305	0.000262	0.067888	0.795112	-0.721113	0.830511	1.63E-05	0.000294046	0.017147777
1893	Jul 27, 2007	0.02578	0.000296	0.000346	0.000307	0.067999	0.794863	-0.720251	0.828985	1.68E-05	0.000302564	0.017394358
1894	Jul 30, 2007	-0.00242	0.000301	0.000294	0.000345	0.067973	0.795305	-0.720863	0.829715	1.65E-05	0.000330603	0.018182487
1895	Jul 31, 2007	0.01669	0.00033	0.000301	0.000294	0.067983	0.795323	-0.720898	0.829775	1.64E-05	0.000324757	0.018021022
1896	Aug 01, 2007	-0.02223	0.000326	0.000331	0.000301	0.068009	0.795425	-0.720877	0.82939	1.66E-05	0.000320553	0.01790399
1897	Aug 02, 2007	0.00253	0.000319	0.000324	0.000329	0.067871	0.795727	-0.721707	0.83063	1.62E-05	0.000309916	0.017604418

No	Tanggal	Residual	CondVar1	CondVar2	CondVar3	ARCH(Alpha1)	GARCH(Beta1)	GARCH(Beta2)	GARCH(Beta3)	Constant(V)	CondVar(t+1)	Volatility
1898	Aug 03, 2007	-0.01952	0.00031	0.000319	0.000324	0.067852	0.795627	-0.721541	0.8305	1.63E-05	0.000327708	0.01810272
1899	Aug 06, 2007	-0.04765	0.000336	0.000318	0.000328	0.068357	0.795721	-0.721938	0.82742	1.81E-05	0.000482486	0.02196556
1900	Aug 07, 2007	1.60E-05	0.00048	0.000335	0.000317	0.067903	0.795909	-0.722505	0.828774	1.77E-05	0.000420419	0.02050411
1901	Aug 08, 2007	-0.00105	0.000419	0.000478	0.000334	0.067552	0.796067	-0.723082	0.830065	1.74E-05	0.000282635	0.016811754
1902	Aug 09, 2007	-0.0094	0.000281	0.000418	0.000477	0.06758	0.79616	-0.723365	0.830615	1.72E-05	0.000340729	0.018458849

Lampiran 17 : Perhitungan Volatilitas Heating Oil Spot Menggunakan Metode ARCH/GARCH Periode 31 Mei 2007-9 Agustus 2007

No	Tanggal	Residual	CondVar1	CondVar2	ARCH(Alpha1)	GARCH(Beta1)	GARCH(Beta2)	Constant(V)	CondVar(t+1)	Volatility
1853	May 31, 2007	0.008925136	0.000477235	0.000471548	0.072686	1.324755	-0.453877	4.11319E-05	0.000465117	0.021566567
1854	Jun 01, 2007	0.016408687	0.000464962	0.000477102	0.072713	1.324692	-0.453807	4.10913E-05	0.000460088	0.021449658
1855	Jun 04, 2007	0.020581472	0.00046014	0.00046509	0.072738	1.324537	-0.453735	4.11255E-05	0.000470379	0.021688231
1856	Jun 05, 2007	0.002223595	0.000469739	0.000459518	0.072742	1.324814	-0.453812	4.09505E-05	0.000455092	0.021332875
1857	Jun 06, 2007	0.002874017	0.000454401	0.000469073	0.072815	1.324700	-0.453592	4.07987E-05	0.000430578	0.020750363
1858	Jun 07, 2007	-0.001285874	0.000429778	0.000453648	0.072975	1.324186	-0.453074	4.06623E-05	0.000404353	0.020108538
1859	Jun 08, 2007	-0.039210657	0.000407119	0.000432407	0.072371	1.325969	-0.454684	4.10187E-05	0.000495506	0.022259961
1860	Jun 11, 2007	0.010946456	0.000494928	0.000406735	0.072216	1.327261	-0.455563	4.08071E-05	0.000521066	0.022826872
1861	Jun 12, 2007	-0.007061699	0.000520371	0.000494254	0.072031	1.328443	-0.4563	4.05845E-05	0.000509931	0.022581655
1862	Jun 13, 2007	0.023561963	0.000510077	0.000520519	0.072062	1.328313	-0.456264	4.06292E-05	0.000520684	0.022818491
1863	Jun 14, 2007	0.027835346	0.000521148	0.000510578	0.072167	1.327855	-0.456089	4.07746E-05	0.000555831	0.023576059
1864	Jun 15, 2007	-0.004189687	0.000555268	0.000520602	0.072012	1.328508	-0.456407	4.06011E-05	0.000541937	0.023279538
1865	Jun 18, 2007	0.008425671	0.000541449	0.000554772	0.071975	1.328444	-0.456216	4.04996E-05	0.000511798	0.022622944
1866	Jun 19, 2007	-0.003593382	0.000511285	0.000540954	0.072043	1.327715	-0.455509	4.04294E-05	0.000473791	0.02176675
1867	Jun 20, 2007	0.002513802	0.000473122	0.000510668	0.072234	1.326495	-0.454468	4.03924E-05	0.000436361	0.020889253
1868	Jun 21, 2007	-0.004251209	0.000435608	0.000472429	0.072495	1.325188	-0.453404	4.03601E-05	0.000404731	0.02011793
1869	Jun 22, 2007	0.005880842	0.000403834	0.000434749	0.072782	1.324159	-0.452603	4.03079E-05	0.000380796	0.019514008
1870	Jun 25, 2007	-0.000442259	0.000379691	0.00040278	0.073103	1.323456	-0.452073	4.02029E-05	0.000360636	0.018990409
1871	Jun 26, 2007	-0.02085997	0.000361213	0.00038025	0.072945	1.323516	-0.452084	0.000040261	0.000378168	0.019446551
1872	Jun 27, 2007	0.011857756	0.000377522	0.000360542	0.072986	1.324076	-0.452486	4.01113E-05	0.000387101	0.019674894
1873	Jun 28, 2007	-0.003444158	0.000386003	0.000376449	0.073009	1.325246	-0.45329	3.98292E-05	0.000381604	0.019534688
1874	Jun 29, 2007	-0.000439856	0.00038043	0.000384845	0.073072	1.326098	-0.453804	3.95412E-05	0.000369398	0.019219741
1875	Jul 02, 2007	0.017499303	0.000369378	0.000380408	0.073079	1.326024	-0.453763	3.95476E-05	0.000379115	0.019470871
1876	Jul 03, 2007	0.001088191	0.000377877	0.000368155	0.073137	1.326749	-0.454128	3.92463E-05	0.000373491	0.019325913
1877	Jul 05, 2007	0.008260554	0.000372461	0.00037687	0.073213	1.327052	-0.4542	3.90215E-05	0.000367118	0.019160315
1878	Jul 06, 2007	0.003352272	0.000365793	0.000371161	0.073334	1.327246	-0.454121	0.00003874	0.000356509	0.018881445
1879	Jul 09, 2007	-0.00517275	0.000355207	0.000364512	0.073475	1.327220	-0.453859	0.000038471	0.000346438	0.018612846
1880	Jul 10, 2007	0.013075662	0.000345747	0.000354509	0.073547	1.327151	-0.453708	3.83548E-05	0.000348944	0.018680046
1881	Jul 11, 2007	-0.011046961	0.000348103	0.000344903	0.073599	1.327269	-0.453617	3.81618E-05	0.000352717	0.01878075
1882	Jul 12, 2007	-4.99E-04	0.000351149	0.000346543	0.073704	1.327584	-0.453549	3.78178E-05	0.000346842	0.018623703
1883	Jul 13, 2007	0.004401423	0.000345292	0.00034961	0.073832	1.327604	-0.453242	3.74976E-05	0.000338881	0.018408731
1884	Jul 16, 2007	-0.025823375	0.000340882	0.000347268	0.073608	1.327742	-0.45373	3.78849E-05	0.000382008	0.019545021
1885	Jul 17, 2007	-0.012930773	0.000381399	0.000340334	0.073594	1.328025	-0.453814	3.77412E-05	0.000402105	0.020052565
1886	Jul 18, 2007	0.026192238	0.000403393	0.000382582	0.073682	1.327202	-0.45352	3.80578E-05	0.000450482	0.02122456
1887	Jul 19, 2007	0.006800442	0.000449426	0.000402403	0.073522	1.328153	-0.45394	3.77685E-05	0.000455409	0.021340305
1888	Jul 20, 2007	-0.007245791	0.000454382	0.000448354	0.073417	1.328327	-0.453693	3.75136E-05	0.000441522	0.021012416
1889	Jul 23, 2007	-0.019066585	0.000441481	0.000454342	0.073412	1.328239	-0.453625	3.75184E-05	0.000444497	0.021083102
1890	Jul 24, 2007	-0.016759446	0.000444208	0.000441234	0.073423	1.327958	-0.453332	3.74848E-05	0.000447972	0.02116535

No	Tanggal	Residual	CondVar1	CondVar2	ARCH(Alpha1)	GARCH(Beta1)	GARCH(Beta2)	Constant(V)	CondVar(t+1)	Volatility
1891	Jul 25, 2007	0.021507132	0.000448225	0.00044438	0.073412	1.328112	-0.453524	3.75142E-05	0.000465227	0.02156912
1892	Jul 26, 2007	-0.018714375	0.000465013	0.000448	0.073375	1.328123	-0.453455	3.74679E-05	0.000477613	0.021854353
1893	Jul 27, 2007	0.017053662	0.000477364	0.000464788	0.073355	1.328098	-0.453337	3.73984E-05	0.000482013	0.021954786
1894	Jul 30, 2007	-0.003705225	0.000481232	0.000476574	0.073307	1.327816	-0.452785	3.72061E-05	0.000461414	0.021480548
1895	Jul 31, 2007	0.01566866	0.000461077	0.000480914	0.073332	1.327458	-0.452395	3.71469E-05	0.000449648	0.021204896
1896	Aug 01, 2007	-0.018923671	0.000449476	0.000460854	0.073301	1.327433	-0.452314	3.71145E-05	0.000451563	0.021250004
1897	Aug 02, 2007	-0.002583253	0.000450866	0.00044876	0.073351	1.326877	-0.451617	0.000036953	0.000433019	0.02080911
1898	Aug 03, 2007	-0.022591789	0.000433242	0.000451101	0.07329	1.327107	-0.451867	3.70043E-05	0.000445532	0.021107633
1899	Aug 06, 2007	-0.043534148	0.000447814	0.000435661	0.073262	1.327369	-0.452775	3.75833E-05	0.000573589	0.023949724
1900	Aug 07, 2007	0.004917614	0.000572519	0.000447337	0.072888	1.329458	-0.454167	3.73092E-05	0.000597046	0.02443452
1901	Aug 08, 2007	0.005549815	0.000596168	0.000571633	0.072616	1.330316	-0.454533	3.71035E-05	0.000572607	0.023929199
1902	Aug 09, 2007	0.006376776	0.000571905	0.000595458	0.072522	1.329736	-0.453746	3.69751E-05	0.00053022	0.023026514

Lampiran 18 : Perhitungan Volatilitas Propane Spot Menggunakan Metode ARCH/GARCH Periode 31 Mei 2007- 9 Agustus 2007

No	Tanggal	Residual 1	Residual 2	CondVar1	CondVar2	CondVar3	ARCH(Alpha1)	ARCH(Alpha2)	GARCH(Beta1)	GARCH(Beta2)	GARCH(Beta3)	Constant(V)	CondVar(t+1)	Volatility
1853	May 31, 2007	-0.015622378	0.000214357	0.00028966	0.000354725	0.000221737	0.232968	0.163063	0.229381	-0.221293	0.483041	8.62854E-05	0.000238203	0.015433839
1854	Jun 01, 2007	-0.000716241	-0.015619159	0.000237617	0.000289416	0.00035413	0.232492	0.163534	0.229583	-0.221449	0.484054	8.58073E-05	0.000287702	0.016961778
1855	Jun 04, 2007	0.001336671	-0.000717058	0.00028747	0.000237309	0.000289212	0.232309	0.163556	0.230006	-0.221757	0.484682	0.000085518	0.000239689	0.015481881
1856	Jun 05, 2007	-0.009859916	0.001348663	0.000239433	0.00028716	0.000237045	0.232232	0.163366	0.230151	-0.221845	0.484781	8.54051E-05	0.000214595	0.01464906
1857	Jun 06, 2007	-0.001470139	-0.009855267	0.000213995	0.0002391	0.000286769	0.232104	0.16403	0.230126	-0.221822	0.485434	8.49611E-05	0.00023681	0.015388628
1858	Jun 07, 2007	-0.00135662	-0.001465618	0.000236416	0.000213572	0.000238797	0.232349	0.164145	0.230594	-0.222145	0.48587	8.46109E-05	0.000208488	0.014439103
1859	Jun 08, 2007	-0.008166758	-0.001344344	0.000208182	0.00023607	0.000213254	0.232478	0.164117	0.23065	-0.222155	0.485845	0.000084473	0.000199456	0.014122895
1860	Jun 11, 2007	0.002928893	-0.008170017	0.000198843	0.000207725	0.000235634	0.23243	0.164908	0.230499	-0.222053	0.486355	8.40436E-05	0.000211354	0.014538021
1861	Jun 12, 2007	-0.003823116	0.002936105	0.000210837	0.000198312	0.000207298	0.232652	0.165033	0.230955	-0.222371	0.486861	8.36459E-05	0.000193989	0.013927998
1862	Jun 13, 2007	0.013154272	-0.003839545	0.000194193	0.000211054	0.000198566	0.232033	0.164625	0.230932	-0.222408	0.48688	8.37732E-05	0.000220933	0.014863815
1863	Jun 14, 2007	0.014736215	0.013142562	0.000221216	0.00019435	0.00021128	0.232426	0.163902	0.230913	-0.222371	0.486021	8.40642E-05	0.000273398	0.016534744
1864	Jun 15, 2007	0.001497576	0.014731333	0.000272884	0.000220767	0.000194106	0.231905	0.163924	0.231377	-0.222727	0.487153	0.000083637	0.000228258	0.015108219
1865	Jun 18, 2007	-4.23E-05	0.001494704	0.00022774	0.000272512	0.000220421	0.232531	0.163501	0.232199	-0.223307	0.487728	8.32315E-05	0.00018313	0.013532557
1866	Jun 19, 2007	-0.000955577	-4.06E-05	0.000182392	0.00022721	0.00027202	0.232957	0.164186	0.232276	-0.22335	0.488135	8.27397E-05	0.000207353	0.014399764
1867	Jun 20, 2007	-0.007924851	-0.000944507	0.000207091	0.000182111	0.000227001	0.232862	0.164223	0.232401	-0.223424	0.488362	8.25354E-05	0.000215605	0.014683499
1868	Jun 21, 2007	0.005489348	-0.007933049	0.00021525	0.000206671	0.000181684	0.23291	0.164495	0.232457	-0.223477	0.48867	8.22519E-05	0.000192256	0.013865645
1869	Jun 22, 2007	-0.002346916	0.005492852	0.000191618	0.000214703	0.000206096	0.233184	0.164809	0.232793	-0.223717	0.489338	8.17554E-05	0.000185437	0.013617541
1870	Jun 25, 2007	-0.002995816	-0.002341841	0.00018478	0.000190971	0.000214136	0.233489	0.165198	0.233136	-0.223957	0.489889	8.12709E-05	0.000189485	0.013765353
1871	Jun 26, 2007	-0.008873087	-0.002982197	0.000189254	0.000184611	0.000190761	0.233431	0.165061	0.233242	-0.224009	0.489963	8.11491E-05	0.000197249	0.014044528
1872	Jun 27, 2007	0.001149912	-0.008872965	0.00019659	0.000188639	0.00018396	0.233422	0.165725	0.233275	-0.224038	0.49068	0.000080656	0.000187874	0.01370673
1873	Jun 28, 2007	0.004533423	0.001142817	0.000187296	0.000196067	0.000188102	0.233654	0.165847	0.233676	-0.224341	0.491258	8.02203E-05	0.000177426	0.013320137
1874	Jun 29, 2007	0.000470351	0.004531916	0.000176633	0.000186535	0.000195331	0.234117	0.166479	0.233874	-0.224477	0.491757	7.96907E-05	0.000178654	0.013366148
1875	Jul 02, 2007	0.007066513	0.000458531	0.000178255	0.000176205	0.000186171	0.234136	0.166682	0.233867	-0.224483	0.491925	7.94548E-05	0.000184897	0.013597677
1876	Jul 03, 2007	-0.000728905	0.007067628	0.000184135	0.000177503	0.000175461	0.234251	0.167267	0.234101	-0.224661	0.492752	7.88907E-05	0.000177057	0.01330629
1877	Jul 05, 2007	0.001223712	-0.000731927	0.000176244	0.00018334	0.000176719	0.234688	0.167653	0.234528	-0.224978	0.493471	7.83185E-05	0.000166052	0.012886126
1878	Jul 06, 2007	0.002158916	0.001219324	0.000165173	0.000175387	0.000182497	0.235136	0.168306	0.234712	-0.225112	0.494028	7.77586E-05	0.00016855	0.01298268
1879	Jul 09, 2007	4.01E-05	0.002158507	0.00016763	0.00016426	0.00017451	0.235461	0.169064	0.234896	-0.225249	0.494755	7.71495E-05	0.000166654	0.012909439
1880	Jul 10, 2007	0.004833726	3.05E-05	0.000165952	0.000166938	0.000163579	0.235688	0.169443	0.235067	-0.225387	0.495221	7.67168E-05	0.000164615	0.012830254
1881	Jul 11, 2007	0.001997175	0.004828773	0.000163674	0.00016503	0.000166017	0.236004	0.170131	0.235262	-0.225537	0.495955	7.61132E-05	0.000164645	0.012831389
1882	Jul 12, 2007	0.010448174	0.001980862	0.000164696	0.000163735	0.000165086	0.235759	0.169846	0.235111	-0.225438	0.495656	7.62319E-05	0.00018627	0.013648094
1883	Jul 13, 2007	-0.001560726	0.010449126	0.000185457	0.000163904	0.000162937	0.235512	0.170552	0.235262	-0.225576	0.496725	7.56473E-05	0.000182435	0.013506863
1884	Jul 16, 2007	0.007408929	-0.001572346	0.000181994	0.000184989	0.000163485	0.235472	0.170535	0.235436	-0.225729	0.497052	7.54024E-05	0.000171101	0.013080551
1885	Jul 17, 2007	-0.003471521	0.007413884	0.000170346	0.000181289	0.000184257	0.235507	0.17099	0.235747	-0.225978	0.49794	7.48526E-05	0.00017803	0.013342774
1886	Jul 18, 2007	-0.004406716	-0.003465198	0.000177419	0.00016972	0.000180696	0.235562	0.171273	0.236056	-0.226209	0.498654	7.43917E-05	0.000174616	0.013214238
1887	Jul 19, 2007	0.004926472	-0.004415923	0.000174018	0.000176767	0.000169053	0.235648	0.171577	0.236271	-0.226394	0.499242	7.39731E-05	0.000168533	0.012982019
1888	Jul 20, 2007	-0.001243539	0.004927787	0.00016765	0.000173167	0.000175908	0.235848	0.172161	0.236584	-0.226645	0.500182	7.33538E-05	0.000166301	0.012895765
1889	Jul 23, 2007	-0.00768341	-0.001231414	0.000166052	0.000167375	0.000172864	0.235791	0.172086	0.236757	-0.226763	0.50042	7.31614E-05	0.000175207	0.013236562
1890	Jul 24, 2007	-0.013177275	-0.007667704	0.000175591	0.000166568	0.000167862	0.235694	0.171321	0.236715	-0.22668	0.499744	0.000073508	0.000212202	0.014567165
1891	Jul 25, 2007	0.017066986	-0.013203276	0.000212998	0.000176208	0.000167019	0.235917	0.170787	0.236542	-0.226576	0.498625	7.39849E-05	0.000266214	0.016316065
1892	Jul 26, 2007	-0.001853575	0.017064136	0.000265523	0.000212421	0.000175751	0.235017	0.170905	0.236942	-0.22694	0.500132	7.35262E-05	0.000226704	0.01505669
1893	Jul 27, 2007	0.014111903	-0.001867484	0.000226758	0.000265507	0.000212616	0.234654	0.17116	0.236308	-0.226469	0.499499	7.37238E-05	0.000220708	0.014856255
1894	Jul 30, 2007	-0.00641995	0.014119637	0.000220262	0.00022643	0.000264997	0.234112	0.171438	0.236425	-0.226597	0.500274	7.34093E-05	0.000250575	0.015829562
1895	Jul 31, 2007	0.009559202	-0.00642659	0.000250272	0.000219985	0.000226092	0.233856	0.171356	0.236529	-0.226707	0.500537	7.32693E-05	0.000224208	0.014973578
1896	Aug 01, 2007	-0.008597094	0.009566596	0.000223976	0.000250018	0.000219741	0.233652	0.171237	0.23674	-0.226882	0.500891	7.30987E-05	0.000212406	0.014574143
1897	Aug 02, 2007	0.002468493	-0.008598195	0.000211894	0.000223504	0.000249557	0.233466	0.17158	0.236981	-0.227102	0.501745	7.26792E-05	0.000211457	0.014541573
1898	Aug 03, 2007	-0.011381986	0.002480778	0.000211355	0.000211824	0.000223474	0.233215	0.171335	0.237006	-0.227114	0.501718	7.26821E-05	0.000218055	0.014766673
1899	Aug 06, 2007	-0.034056032	-0.011371916	0.000219979	0.000213136	0.000213838	0.234528	0.170442	0.237039	-0.227047	0.499961	0.000073907	0.00047862	0.021877377
1900	Aug 07, 2007	-0.001272073	-0.03405189	0.000475897	0.000219757	0.000213104	0.232275	0.171147	0.236625	-0.226822	0.501702	7.36191E-05	0.000442124	0.021026736
1901	Aug 08, 2007	0.003487899	-0.001269144	0.000440432	0.000475932	0.000219799	0.232434	0.16928	0.238303	-0.228118	0.502951	7.33729E-05	0.000183409	0.013542862
1902	Aug 09, 2007	-0.008069594	0.003499347	0.000183125	0.000439824	0.000475688	0.232615	0.169001	0.238588	-0.228324	0.503035	0.000073236	0.00027301	0.016523001

Lampiran 19 : Perhitungan Volatilitas WTI Future Menggunakan Metode ARCH/GARCH Periode 31 Mei 2007-9 Agustus 2007

No	Tanggal	Residual 1	Residual 2	CondVar1	CondVar2	CondVar3	ARCH(Alpha1)	ARCH(Alpha2)	GARCH(Beta1)	GARCH(Beta2)	GARCH(Beta3)	Constant(V)	CondVar(t+1)	Volatility
1848	May 31, 2007	0.007400	0.004060	0.000347	0.000501	0.000369	0.078036	0.049423	(0.680955)	0.752887	0.716193	0.000047	0.000457	0.021377
1849	Jun 01, 2007	0.015800	0.007350	0.000409	0.000410	0.000444	0.068115	0.066158	(0.807803)	0.883850	0.696800	0.000051	0.000413	0.020326
1850	Jun 04, 2007	0.016590	0.015840	0.000378	0.000457	0.000347	0.078054	0.049398	(0.680184)	0.753022	0.715637	0.000047	0.000416	0.020389
1851	Jun 05, 2007	(0.009710)	0.016600	0.000414	0.000378	0.000456	0.078033	0.049060	(0.675891)	0.752287	0.713136	0.000046	0.000397	0.019918
1852	Jun 06, 2007	0.004400	(0.009670)	0.000382	0.000414	0.000391	0.064933	(0.024504)	0.521124	0.688732	(0.275660)	0.000014	0.000389	0.019733
1853	Jun 07, 2007	0.013860	0.004390	0.000389	0.000382	0.000413	0.065087	(0.026185)	0.546185	0.684138	(0.293555)	0.000013	0.000378	0.019441
1854	Jun 08, 2007	(0.033520)	0.013900	0.000377	0.000388	0.000381	0.064773	(0.039592)	0.761603	0.649932	(0.452682)	0.000009	0.000441	0.020993
1855	Jun 11, 2007	0.017200	(0.033540)	0.000441	0.000376	0.000387	0.065674	(0.053846)	0.974526	0.608256	(0.602045)	0.000004	0.000388	0.019708
1856	Jun 12, 2007	(0.009960)	0.017210	0.000389	0.000443	0.000377	0.067530	(0.044147)	0.799249	0.633727	(0.471131)	0.000008	0.000416	0.020391
1857	Jun 13, 2007	0.012830	(0.009950)	0.000413	0.000387	0.000437	0.062501	(0.030931)	0.655588	0.663050	(0.369941)	0.000011	0.000384	0.019589
1858	Jun 14, 2007	0.020150	0.012820	0.000384	0.000413	0.000388	0.062579	(0.030974)	0.655372	0.663049	(0.369806)	0.000011	0.000413	0.020326
1859	Jun 15, 2007	0.004660	0.020150	0.000412	0.000383	0.000412	0.062605	(0.031085)	0.658061	0.659759	(0.368938)	0.000011	0.000371	0.019268
1860	Jun 18, 2007	0.015130	0.004650	0.000371	0.000412	0.000383	0.062721	(0.031331)	0.659400	0.660903	(0.371135)	0.000011	0.000399	0.019977
1861	Jun 19, 2007	(0.000450)	0.015130	0.000399	0.000371	0.000411	0.062818	(0.031422)	0.661625	0.656819	(0.369148)	0.000011	0.000359	0.018954
1862	Jun 20, 2007	(0.014110)	(0.000440)	0.000358	0.000398	0.000370	0.062842	(0.031501)	0.661898	0.657760	(0.370178)	0.000010	0.000385	0.019613
1863	Jun 21, 2007	0.005640	(0.014110)	0.000384	0.000358	0.000398	0.063013	(0.031537)	0.662820	0.653526	(0.366965)	0.000010	0.000349	0.018670
1864	Jun 22, 2007	0.006370	0.005630	0.000348	0.000384	0.000357	0.063193	(0.031641)	0.660851	0.656107	(0.367539)	0.000010	0.000363	0.019041
1865	Jun 25, 2007	(0.000160)	0.006370	0.000361	0.000347	0.000383	0.063462	(0.031772)	0.663076	0.650784	(0.364503)	0.000010	0.000335	0.018292
1866	Jun 26, 2007	(0.021430)	(0.000140)	0.000336	0.000362	0.000348	0.063297	(0.031719)	0.664749	0.649418	(0.364690)	0.000010	0.000371	0.019259
1867	Jun 27, 2007	0.016330	(0.021440)	0.000370	0.000335	0.000361	0.063391	(0.031696)	0.663732	0.648628	(0.363053)	0.000010	0.000344	0.018559
1868	Jun 28, 2007	0.008110	0.016330	0.000344	0.000370	0.000335	0.063387	(0.031701)	0.662802	0.651726	(0.365041)	0.000010	0.000353	0.018782
1869	Jun 29, 2007	0.015100	0.008090	0.000352	0.000344	0.000369	0.063508	(0.031874)	0.664966	0.650455	(0.365781)	0.000010	0.000345	0.018586
1870	Jul 02, 2007	0.005180	0.015100	0.000345	0.000352	0.000343	0.063489	(0.031723)	0.662250	0.653351	(0.365996)	0.000010	0.000337	0.018371
1871	Jul 03, 2007	0.003710	0.005170	0.000336	0.000344	0.000351	0.063764	(0.032129)	0.667721	0.649520	(0.367210)	0.000010	0.000329	0.018134
1872	Jul 05, 2007	0.004770	0.003700	0.000328	0.000335	0.000343	0.063912	(0.032157)	0.666772	0.650727	(0.367460)	0.000010	0.000322	0.017932
1873	Jul 06, 2007	0.013020	0.004760	0.000321	0.000327	0.000335	0.064127	(0.032261)	0.666994	0.649280	(0.366318)	0.000010	0.000324	0.017991
1874	Jul 09, 2007	(0.009210)	0.013030	0.000323	0.000320	0.000327	0.064138	(0.032052)	0.664624	0.649618	(0.364480)	0.000010	0.000313	0.017697
1875	Jul 10, 2007	0.007500	(0.009210)	0.000313	0.000322	0.000319	0.064359	(0.032173)	0.665689	0.648013	(0.363903)	0.000010	0.000312	0.017652
1876	Jul 11, 2007	(0.004190)	0.007500	0.000311	0.000312	0.000321	0.064455	(0.032137)	0.665656	0.647853	(0.363682)	0.000010	0.000301	0.017361
1877	Jul 12, 2007	(0.001790)	(0.004190)	0.000300	0.000309	0.000311	0.064693	(0.032205)	0.666499	0.646024	(0.362697)	0.000010	0.000296	0.017204
1878	Jul 13, 2007	0.018600	(0.001810)	0.000296	0.000300	0.000310	0.064773	(0.032308)	0.666349	0.646340	(0.362888)	0.000010	0.000311	0.017622
1879	Jul 16, 2007	0.002390	0.018630	0.000311	0.000295	0.000298	0.069513	(0.047223)	0.832320	0.621309	(0.487996)	0.000007	0.000287	0.016950
1880	Jul 17, 2007	(0.002620)	0.002400	0.000286	0.000308	0.000294	0.064939	(0.032233)	0.667187	0.645656	(0.362868)	0.000009	0.000293	0.017106
1881	Jul 18, 2007	0.012860	(0.002630)	0.000292	0.000285	0.000308	0.065093	(0.032353)	0.668265	0.644885	(0.363107)	0.000009	0.000287	0.016939
1882	Jul 19, 2007	0.010830	0.012840	0.000287	0.000291	0.000285	0.065207	(0.032287)	0.666708	0.645315	(0.362097)	0.000009	0.000288	0.016957
1883	Jul 20, 2007	(0.005350)	0.010830	0.000286	0.000285	0.000290	0.065306	(0.032425)	0.670133	0.643399	(0.363258)	0.000009	0.000277	0.016639
1884	Jul 23, 2007	(0.010050)	(0.005350)	0.000276	0.000285	0.000284	0.065331	(0.032494)	0.672118	0.643480	(0.365033)	0.000009	0.000280	0.016729
1885	Jul 24, 2007	(0.018990)	(0.010030)	0.000281	0.000277	0.000286	0.065175	(0.032372)	0.671845	0.643532	(0.364839)	0.000009	0.000292	0.017087
1886	Jul 25, 2007	0.029780	(0.019030)	0.000294	0.000283	0.000279	0.065580	(0.033155)	0.675116	0.641687	(0.366304)	0.000009	0.000333	0.018256
1887	Jul 26, 2007	(0.012670)	0.029770	0.000333	0.000294	0.000283	0.065270	(0.032912)	0.675275	0.642109	(0.366647)	0.000009	0.000300	0.017330
1888	Jul 27, 2007	0.026110	(0.012690)	0.000301	0.000336	0.000295	0.066491	(0.041435)	0.776606	0.649516	(0.464655)	0.000007	0.000361	0.018996
1889	Jul 30, 2007	(0.002890)	0.026110	0.000364	0.000303	0.000338	0.069892	(0.047367)	0.833034	0.619597	(0.487140)	0.000007	0.000301	0.017354
1890	Jul 31, 2007	0.016780	(0.002890)	0.000300	0.000357	0.000301	0.065042	(0.032167)	0.667360	0.640912	(0.358528)	0.000009	0.000349	0.018669
1891	Aug 01, 2007	(0.022290)	0.016850	0.000355	0.000301	0.000364	0.070008	(0.047770)	0.836696	0.620147	(0.490967)	0.000007	0.000333	0.018240
1892	Aug 02, 2007	0.002890	(0.022300)	0.000328	0.000348	0.000299	0.064822	(0.032251)	0.666513	0.646827	(0.362936)	0.000009	0.000329	0.018136
1893	Aug 03, 2007	(0.018970)	0.002900	0.000329	0.000328	0.000348	0.064702	(0.032123)	0.666230	0.647110	(0.362959)	0.000009	0.000337	0.018367
1894	Aug 06, 2007	(0.047550)	(0.018910)	0.000345	0.000334	0.000336	0.068615	(0.057062)	1.012492	0.555516	(0.585895)	0.000003	0.000476	0.021821
1895	Aug 07, 2007	0.003190	(0.047640)	0.000483	0.000372	0.000326	0.081164	0.050929	(0.672195)	0.751618	0.712403	0.000042	0.000345	0.018585
1896	Aug 08, 2007	(0.004550)	0.003170	0.000351	0.000467	0.000342	0.064560	(0.032869)	0.689217	0.632752	(0.371183)	0.000009	0.000421	0.020517
1897	Aug 09, 2007	(0.008770)	(0.004540)	0.000419	0.000349	0.000466	0.064432	(0.033681)	0.702982	0.628778	(0.379259)	0.000009	0.000351	0.018723

Lampiran 20 : Perhitungan Volatilitas Heating Oil Future Menggunakan Metode ARCH/GARCH Periode 31 Mei 2007- 9 Agustus 2007

No	Tanggal	Residual 1	Residual 2	CondVar1	CondVar2	CondVar3	ARCH(Alpha1)	ARCH(Alpha2)	GARCH(Beta1)	GARCH(Beta2)	GARCH(Beta3)	Constant(V)	CondVar(t+1)	Volatility
1848	May 31, 2007	0.003150	0.001460	0.000416	0.000552	0.000394	0.098405	0.113422	(0.781153)	0.783280	0.654552	0.000090	0.000456	0.021359
1849	Jun 01, 2007	0.020390	0.003140	0.000456	0.000416	0.000552	0.098427	0.113446	(0.781153)	0.783251	0.654544	0.000090	0.000463	0.021510
1850	Jun 04, 2007	0.021360	0.020380	0.000463	0.000456	0.000416	0.098492	0.113513	(0.781271)	0.783128	0.654557	0.000090	0.000449	0.021200
1851	Jun 05, 2007	(0.000230)	0.021360	0.000449	0.000462	0.000455	0.098275	0.113401	(0.780238)	0.783643	0.654147	0.000089	0.000450	0.021218
1852	Jun 06, 2007	0.003890	(0.000230)	0.000450	0.000448	0.000461	0.098260	0.113290	(0.780773)	0.784147	0.654912	0.000089	0.000392	0.019798
1853	Jun 07, 2007	0.000690	0.003890	0.000392	0.000449	0.000447	0.098217	0.113349	(0.780024)	0.784443	0.654594	0.000088	0.000429	0.020708
1854	Jun 08, 2007	(0.040820)	0.000710	0.000432	0.000393	0.000451	0.097992	0.113362	(0.780669)	0.783633	0.654704	0.000089	0.000519	0.022773
1855	Jun 11, 2007	0.013700	(0.040820)	0.000518	0.000431	0.000393	0.097610	0.113042	(0.780642)	0.784417	0.655334	0.000089	0.000487	0.022060
1856	Jun 12, 2007	(0.008190)	0.013690	0.000486	0.000518	0.000431	0.097566	0.112864	(0.781322)	0.784918	0.656237	0.000088	0.000426	0.020633
1857	Jun 13, 2007	0.023730	(0.008210)	0.000426	0.000486	0.000519	0.097693	0.112914	(0.781802)	0.784680	0.656437	0.000089	0.000540	0.023243
1858	Jun 14, 2007	0.027170	0.023720	0.000540	0.000427	0.000486	0.097844	0.113113	(0.781845)	0.784262	0.656191	0.000089	0.000456	0.021363
1859	Jun 15, 2007	(0.002680)	0.027170	0.000455	0.000539	0.000425	0.097446	0.112840	(0.782208)	0.785223	0.657280	0.000088	0.000519	0.022777
1860	Jun 18, 2007	0.010730	(0.002680)	0.000519	0.000455	0.000539	0.097406	0.112714	(0.781998)	0.785499	0.657294	0.000088	0.000406	0.020141
1861	Jun 19, 2007	(0.004110)	0.010730	0.000404	0.000519	0.000454	0.097198	0.112621	(0.782499)	0.786217	0.658279	0.000087	0.000492	0.022192
1862	Jun 20, 2007	0.002530	(0.004110)	0.000491	0.000404	0.000518	0.097216	0.112557	(0.781592)	0.786353	0.657631	0.000087	0.000364	0.019076
1863	Jun 21, 2007	(0.005270)	0.002530	0.000363	0.000490	0.000403	0.097174	0.112596	(0.782369)	0.786917	0.658674	0.000086	0.000457	0.021369
1864	Jun 22, 2007	0.005550	(0.005270)	0.000456	0.000363	0.000490	0.097265	0.112640	(0.780987)	0.786852	0.657516	0.000086	0.000344	0.018539
1865	Jun 25, 2007	0.001520	0.005540	0.000342	0.000456	0.000362	0.097346	0.112767	(0.782045)	0.787389	0.658708	0.000085	0.000419	0.020470
1866	Jun 26, 2007	(0.025100)	0.001540	0.000419	0.000342	0.000456	0.097192	0.112627	(0.782837)	0.787630	0.659474	0.000085	0.000389	0.019720
1867	Jun 27, 2007	0.013900	(0.025110)	0.000388	0.000419	0.000342	0.097107	0.112553	(0.783268)	0.788110	0.660142	0.000085	0.000427	0.020657
1868	Jun 28, 2007	(0.003430)	0.013900	0.000425	0.000388	0.000418	0.097189	0.112596	(0.782397)	0.788131	0.659566	0.000085	0.000356	0.018880
1869	Jun 29, 2007	0.005760	(0.003430)	0.000355	0.000425	0.000387	0.097171	0.112627	(0.782464)	0.788750	0.659928	0.000084	0.000401	0.020032
1870	Jul 02, 2007	0.013970	0.005750	0.000400	0.000355	0.000424	0.097270	0.112706	(0.782163)	0.788693	0.659717	0.000084	0.000353	0.018795
1871	Jul 03, 2007	0.001770	0.013970	0.000352	0.000400	0.000354	0.097221	0.112705	(0.781996)	0.789407	0.659936	0.000083	0.000379	0.019479
1872	Jul 05, 2007	0.009360	0.001760	0.000378	0.000352	0.000399	0.097394	0.112854	(0.781553)	0.789342	0.659641	0.000083	0.000337	0.018363
1873	Jul 06, 2007	0.003200	0.009350	0.000335	0.000377	0.000350	0.097433	0.112954	(0.780894)	0.789896	0.659328	0.000082	0.000360	0.018969
1874	Jul 09, 2007	(0.001850)	0.003200	0.000359	0.000335	0.000376	0.097615	0.113104	(0.780454)	0.789963	0.659160	0.000082	0.000315	0.017756
1875	Jul 10, 2007	0.013770	(0.001860)	0.000314	0.000359	0.000334	0.097681	0.113183	(0.780246)	0.790140	0.659049	0.000081	0.000359	0.018945
1876	Jul 11, 2007	(0.011260)	0.013780	0.000358	0.000314	0.000358	0.097702	0.113199	(0.779852)	0.790383	0.658981	0.000081	0.000319	0.017874
1877	Jul 12, 2007	(0.003690)	(0.011260)	0.000319	0.000357	0.000313	0.097767	0.113305	(0.779127)	0.790948	0.658658	0.000080	0.000336	0.018322
1878	Jul 13, 2007	0.006110	(0.003700)	0.000334	0.000318	0.000356	0.097885	0.113423	(0.778671)	0.791190	0.658565	0.000079	0.000311	0.017623
1879	Jul 16, 2007	(0.027020)	0.006140	0.000312	0.000336	0.000319	0.097680	0.113183	(0.779522)	0.790532	0.658955	0.000080	0.000389	0.019713
1880	Jul 17, 2007	(0.012710)	(0.027010)	0.000389	0.000311	0.000336	0.097552	0.113104	(0.779032)	0.790947	0.658922	0.000080	0.000343	0.018507
1881	Jul 18, 2007	0.033440	(0.012760)	0.000345	0.000391	0.000314	0.097588	0.113181	(0.778941)	0.789228	0.657744	0.000082	0.000456	0.021348
1882	Jul 19, 2007	0.004740	0.033440	0.000454	0.000345	0.000390	0.097097	0.112804	(0.778180)	0.790317	0.658014	0.000081	0.000385	0.019627
1883	Jul 20, 2007	(0.011230)	0.004750	0.000384	0.000453	0.000344	0.097058	0.112674	(0.779104)	0.790942	0.659208	0.000080	0.000381	0.019521
1884	Jul 23, 2007	(0.018630)	(0.011210)	0.000381	0.000384	0.000453	0.097011	0.112662	(0.778761)	0.791002	0.658980	0.000080	0.000434	0.020825
1885	Jul 24, 2007	(0.013780)	(0.018620)	0.000433	0.000380	0.000384	0.096917	0.112515	(0.779041)	0.791510	0.659550	0.000080	0.000354	0.018816
1886	Jul 25, 2007	0.015800	(0.013800)	0.000353	0.000433	0.000380	0.096847	0.112475	(0.779112)	0.791777	0.659851	0.000080	0.000444	0.021065
1887	Jul 26, 2007	(0.016400)	0.015800	0.000443	0.000353	0.000433	0.096722	0.112322	(0.778862)	0.792196	0.659914	0.000079	0.000354	0.018804
1888	Jul 27, 2007	0.018190	(0.016410)	0.000353	0.000443	0.000353	0.096714	0.112297	(0.779134)	0.792298	0.660219	0.000079	0.000450	0.021224
1889	Jul 30, 2007	(0.004020)	0.018190	0.000449	0.000353	0.000442	0.096485	0.112045	(0.777956)	0.793016	0.659727	0.000079	0.000339	0.018422
1890	Jul 31, 2007	0.015740	(0.004040)	0.000339	0.000449	0.000352	0.096473	0.112027	(0.778636)	0.793266	0.660501	0.000078	0.000429	0.020704
1891	Aug 01, 2007	(0.014930)	0.015750	0.000428	0.000338	0.000448	0.096335	0.111906	(0.777571)	0.793607	0.659861	0.000078	0.000358	0.018926
1892	Aug 02, 2007	0.001100	(0.014930)	0.000357	0.000428	0.000337	0.096177	0.111721	(0.779585)	0.794707	0.662352	0.000077	0.000387	0.019674
1893	Aug 03, 2007	(0.020530)	0.001120	0.000387	0.000357	0.000428	0.096145	0.111694	(0.779579)	0.794728	0.662353	0.000077	0.000383	0.019575
1894	Aug 06, 2007	(0.049180)	(0.020500)	0.000390	0.000391	0.000364	0.097501	0.113102	(0.773862)	0.788553	0.653447	0.000082	0.000610	0.024689
1895	Aug 07, 2007	0.010220	(0.049190)	0.000607	0.000389	0.000390	0.096875	0.112545	(0.773200)	0.789710	0.653839	0.000081	0.000456	0.021361
1896	Aug 08, 2007	0.001000	0.010210	0.000454	0.000606	0.000388	0.096684	0.112187	(0.776030)	0.790865	0.656970	0.000080	0.000474	0.021770
1897	Aug 09, 2007	0.010550	0.001000	0.000473	0.000454	0.000605	0.096317	0.111965	(0.774533)	0.791430	0.656270	0.000080	0.000481	0.021921

Lampiran 21 : Hasil Backtesting Periode Out of Sample EWMA untuk WTI Spot Periode 1 Juni 2007- 9 Agustus 2007

(dalam USD)

Tanggal	*Actual Price (dollars/barrel)*	*Return*	*Forecast Variance dengan EWMA*	*Forecast Volatility dengan EWMA*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
31-May-07	64.02	0.008628	0.000335271	0.018310418	64,020	2.740	1	3,211	1,070	(3,211)	0
1-Jun-07	65.09	0.016575	0.000333732	0.018268329	65,090	2.740	1	3,258	1,080	(3,258)	0
4-Jun-07	66.17	0.016456	0.000332136	0.018224601	66,170	2.740	1	3,304	(540)	(3,304)	0
5-Jun-07	65.63	(0.008194)	0.000327014	0.018083516	65,630	2.740	1	3,251	340	(3,251)	0
6-Jun-07	65.97	0.005167	0.000320905	0.017913818	65,970	2.740	1	3,238	960	(3,238)	0
7-Jun-07	66.93	0.014447	0.00031836	0.017842643	66,930	2.740	1	3,272	(2,150)	(3,272)	0
8-Jun-07	64.78	(0.032650)	0.000333999	0.018275634	64,780	2.740	1	3,243	1,150	(3,243)	0
11-Jun-07	65.93	0.017597	0.000333157	0.018252580	65,930	2.740	1	3,297	(570)	(3,297)	0
12-Jun-07	65.36	(0.008683)	0.000328186	0.018115901	65,360	2.740	1	3,244	810	(3,244)	0
13-Jun-07	66.17	0.012317	0.000324407	0.018011300	66,170	2.740	1	3,265	1,450	(3,265)	0
14-Jun-07	67.62	0.021677	0.000326859	0.018079242	67,620	2.740	1	3,349	420	(3,349)	0
15-Jun-07	68.04	0.006192	0.000320959	0.017915328	68,040	2.740	1	3,339	1,020	(3,339)	0
18-Jun-07	69.06	0.014880	0.000318642	0.017850556	69,060	2.740	1	3,377	90	(3,377)	0
19-Jun-07	69.15	0.001302	0.00031228	0.017671456	69,150	2.740	1	3,348	(650)	(3,348)	0
20-Jun-07	68.5	(0.009444)	0.000308036	0.017550959	68,500	2.740	1	3,294	(150)	(3,294)	0
21-Jun-07	68.35	(0.002192)	0.000302026	0.017378896	68,350	2.740	1	3,254	500	(3,254)	0
22-Jun-07	68.85	0.007289	0.000296893	0.017230576	68,850	2.740	1	3,250	(20)	(3,250)	0
25-Jun-07	68.83	(0.000291)	0.000290969	0.017057819	68,830	2.740	1	3,216	(1,050)	(3,216)	0
26-Jun-07	67.78	(0.015373)	0.000290218	0.017035790	67,780	2.740	1	3,163	1,200	(3,163)	0
27-Jun-07	68.98	0.017549	0.000290196	0.017035129	68,980	2.740	1	3,219	630	(3,219)	0
28-Jun-07	69.61	0.009092	0.000285848	0.016907028	69,610	2.740	1	3,224	860	(3,224)	0
29-Jun-07	70.47	0.012279	0.000282873	0.016818821	70,470	2.740	1	3,247	640	(3,247)	0
2-Jul-07	71.11	0.009041	0.000278647	0.016692727	71,110	2.740	1	3,252	300	(3,252)	0
3-Jul-07	71.41	0.004210	0.000273337	0.016532905	71,410	2.740	1	3,234	400	(3,234)	0
5-Jul-07	71.81	0.005586	0.00026837	0.016381990	71,810	2.740	1	3,223	990	(3,223)	0
6-Jul-07	72.8	0.013692	0.000266432	0.016322735	72,800	2.740	1	3,255	(660)	(3,255)	0
9-Jul-07	72.14	(0.009107)	0.000262987	0.016216871	72,140	2.740	1	3,205	660	(3,205)	0
10-Jul-07	72.8	0.009107	0.000259176	0.016098936	72,800	2.740	1	3,211	(220)	(3,211)	0
11-Jul-07	72.58	(0.003027)	0.000254255	0.015945374	72,580	2.740	1	3,171	(30)	(3,171)	0
12-Jul-07	72.55	(0.000413)	0.00024919	0.015785758	72,550	2.740	1	3,137	1,340	(3,137)	0
13-Jul-07	73.89	0.018302	0.000250471	0.015826282	73,890	2.740	1	3,204	220	(3,204)	0
16-Jul-07	74.11	0.002973	0.000245573	0.015670774	74,110	2.740	1	3,182	(80)	(3,182)	0
17-Jul-07	74.03	(0.001080)	0.000240719	0.015515118	74,030	2.740	1	3,147	1,000	(3,147)	0
18-Jul-07	75.03	0.013418	0.000239182	0.015465505	75,030	2.740	1	3,179	870	(3,179)	0
19-Jul-07	75.9	0.011529	0.000236775	0.015387486	75,900	2.740	1	3,200	(370)	(3,200)	0
20-Jul-07	75.53	(0.004887)	0.000232648	0.015252794	75,530	2.740	1	3,156	(880)	(3,156)	0
23-Jul-07	74.65	(0.011719)	0.000231039	0.015199981	74,650	2.740	1	3,109	(1,270)	(3,109)	0
24-Jul-07	73.38	(0.017159)	0.000232728	0.015255423	73,380	2.740	1	3,067	2,360	(3,067)	0
25-Jul-07	75.74	0.031655	0.000247351	0.015727399	75,740	2.740	1	3,263	(780)	(3,263)	0
26-Jul-07	74.96	(0.010352)	0.000244811	0.015646427	74,960	2.740	1	3,213	2,070	(3,213)	0
27-Jul-07	77.03	0.027240	0.000254082	0.015939944	77,030	2.740	1	3,364	(210)	(3,364)	0
30-Jul-07	76.82	(0.002730)	0.000249227	0.015786915	76,820	2.740	1	3,322	1,380	(3,322)	0
31-Jul-07	78.2	0.017805	0.000250133	0.015815597	78,200	2.740	1	3,388	(1,710)	(3,388)	0
1-Aug-07	76.49	(0.022110)	0.000255479	0.015983724	76,490	2.740	1	3,349	350	(3,349)	0
2-Aug-07	76.84	0.004565	0.00025068	0.015832876	76,840	2.740	1	3,333	(1,430)	(3,333)	0

Tanggal	*Actual Price (dollars/barrel)*	*Return*	*Forecast Variance dengan EWMA*	*Forecast Volatility dengan EWMA*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
3-Aug-07	75.41	(0.018785)	0.000253196	0.015912141	75,410	2.740	1	3,287	(3,380)	(3,287)	1
6-Aug-07	72.03	(0.045857)	0.000291266	0.017066521	72,030	2.740	1	3,368	220	(3,368)	0
7-Aug-07	72.25	0.003050	0.000285565	0.016898662	72,250	2.740	1	3,345	(20)	(3,345)	0
8-Aug-07	72.23	(0.000277)	0.000279867	0.016729241	72,230	2.740	1	3,310	(610)	(3,310)	0
9-Aug-07	71.62	(0.008481)	0.000275903	0.016610331	71,620	2.740	1	3,259	(130)	(3,259)	0
10-Aug-07	71.49	(0.001817)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Lampiran 22 : Hasil Backtesting Periode Out of Sample EWMA untuk Heating Oil Spot Periode 1 Juni 2007- 9 Agustus 2007

(dalam USD)

Tanggal	*Actual Price(cents per gallon)*	*Return*	*Forecast Variance dengan EWMA*	*Forecast Volatility dengan EWMA*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
31-May-07	189.15	0.010096	0.000344798	0.018568740	79,443	3.778	1	5,573	1,365	(5,573)	0
1-Jun-07	192.4	0.017036	0.000343331	0.018529196	80,808	3.778	1	5,657	1,714	(5,657)	0
4-Jun-07	196.48	0.020984	0.000344791	0.018568557	82,522	3.778	1	5,789	206	(5,789)	0
5-Jun-07	196.97	0.002491	0.000337968	0.018383896	82,727	3.778	1	5,746	315	(5,746)	0
6-Jun-07	197.72	0.003800	0.000331414	0.018204780	83,042	3.778	1	5,712	(34)	(5,712)	0
7-Jun-07	197.64	(0.000405)	0.000324806	0.018022365	83,009	3.778	1	5,652	(3,112)	(5,652)	0
8-Jun-07	190.23	(0.038213)	0.000348395	0.018665345	79,897	3.778	1	5,634	1,071	(5,634)	0
11-Jun-07	192.78	0.013316	0.000344683	0.018565629	80,968	3.778	1	5,680	(529)	(5,680)	0
12-Jun-07	191.52	(0.006557)	0.000338802	0.018406579	80,438	3.778	1	5,594	2,020	(5,594)	0
13-Jun-07	196.33	0.024805	0.000343773	0.018541127	82,459	3.778	1	5,776	2,339	(5,776)	0
14-Jun-07	201.9	0.027976	0.000351891	0.018758754	84,798	3.778	1	6,010	(353)	(6,010)	0
15-Jun-07	201.06	(0.004169)	0.000345309	0.018582498	84,445	3.778	1	5,929	815	(5,929)	0
18-Jun-07	203	0.009603	0.000340021	0.018439655	85,260	3.778	1	5,940	(248)	(5,940)	0
19-Jun-07	202.41	(0.002911)	0.000333468	0.018261118	85,012	3.778	1	5,865	311	(5,865)	0
20-Jun-07	203.15	0.003649	0.000326984	0.018082693	85,323	3.778	1	5,829	(286)	(5,829)	0
21-Jun-07	202.47	(0.003353)	0.000320758	0.017909716	85,037	3.778	1	5,754	601	(5,754)	0
22-Jun-07	203.9	0.007038	0.000315169	0.017753010	85,638	3.778	1	5,744	29	(5,744)	0
25-Jun-07	203.97	0.000343	0.000308867	0.017574624	85,667	3.778	1	5,688	(1,684)	(5,688)	0
26-Jun-07	199.96	(0.019856)	0.000311059	0.017636851	83,983	3.778	1	5,596	1,151	(5,596)	0
27-Jun-07	202.7	0.013610	0.000308225	0.017556331	85,134	3.778	1	5,647	(248)	(5,647)	0
28-Jun-07	202.11	(0.002915)	0.000302307	0.017386987	84,886	3.778	1	5,576	59	(5,576)	0
29-Jun-07	202.25	0.000692	0.000296261	0.017212244	84,945	3.778	1	5,524	1,588	(5,524)	0
2-Jul-07	206.03	0.018517	0.000296752	0.017226495	86,533	3.778	1	5,632	126	(5,632)	0
3-Jul-07	206.33	0.001455	0.000290831	0.017053773	86,659	3.778	1	5,584	806	(5,584)	0
5-Jul-07	208.25	0.009262	0.000286508	0.016926561	87,465	3.778	1	5,594	357	(5,594)	0
6-Jul-07	209.1	0.004073	0.000281016	0.016763534	87,822	3.778	1	5,562	(374)	(5,562)	0
9-Jul-07	208.21	(0.004265)	0.000275874	0.016609448	87,448	3.778	1	5,488	1,260	(5,488)	0
10-Jul-07	211.21	0.014306	0.000274098	0.016555910	88,708	3.778	1	5,549	(928)	(5,549)	0
11-Jul-07	209	(0.010519)	0.000271101	0.016465146	87,780	3.778	1	5,461	84	(5,461)	0
12-Jul-07	209.2	0.000956	0.000265681	0.016299731	87,864	3.778	1	5,411	479	(5,411)	0
13-Jul-07	210.34	0.005435	0.000260831	0.016150249	88,343	3.778	1	5,391	(2,180)	(5,391)	0
16-Jul-07	205.15	(0.024984)	0.000268717	0.016392576	86,163	3.778	1	5,337	(941)	(5,337)	0
17-Jul-07	202.91	(0.010979)	0.00026602	0.016310113	85,222	3.778	1	5,252	2,390	(5,252)	0
18-Jul-07	208.6	0.027656	0.000275341	0.016593388	87,612	3.778	1	5,493	601	(5,493)	0
19-Jul-07	210.03	0.006832	0.000270606	0.016450118	88,213	3.778	1	5,483	(567)	(5,483)	0
20-Jul-07	208.68	(0.006448)	0.000266192	0.016315394	87,646	3.778	1	5,403	(1,546)	(5,403)	0
23-Jul-07	205	(0.017792)	0.000267634	0.016359535	86,100	3.778	1	5,322	(1,289)	(5,322)	0
24-Jul-07	201.93	(0.015089)	0.000267194	0.016346064	84,811	3.778	1	5,238	1,982	(5,238)	0
25-Jul-07	206.65	0.023105	0.000271992	0.016492185	86,793	3.778	1	5,408	(1,596)	(5,408)	0
26-Jul-07	202.85	(0.018560)	0.000273885	0.016549463	85,197	3.778	1	5,327	1,617	(5,327)	0
27-Jul-07	206.7	0.018802	0.000275043	0.016584410	86,814	3.778	1	5,440	(294)	(5,440)	0
30-Jul-07	206	(0.003392)	0.00026986	0.016427403	86,520	3.778	1	5,370	1,470	(5,370)	0
31-Jul-07	209.5	0.016848	0.000269742	0.016423830	87,990	3.778	1	5,460	(1,617)	(5,460)	0
1-Aug-07	205.65	(0.018548)	0.000271679	0.016482673	86,373	3.778	1	5,379	(71)	(5,379)	0
2-Aug-07	205.48	(0.000827)	0.000266285	0.016318239	86,302	3.778	1	5,321	(1,840)	(5,321)	0

Tanggal	*Actual Price(cents per gallon)*	*Return*	*Forecast Variance dengan EWMA*	*Forecast Volatility dengan EWMA*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
3-Aug-07	201.1	(0.021546)	0.000270746	0.016454346	84,462	3.778	1	5,251	(3,452)	(5,251)	0
6-Aug-07	192.88	(0.041734)	0.000301073	0.017351465	81,010	3.778	1	5,311	609	(5,311)	0
7-Aug-07	194.33	0.007490	0.000296023	0.017205309	81,619	3.778	1	5,306	512	(5,306)	0
8-Aug-07	195.55	0.006258	0.000290759	0.017051647	82,131	3.778	1	5,291	588	(5,291)	0
9-Aug-07	196.95	0.007134	0.000285814	0.016906038	82,719	3.778	1	5,284	(294)	(5,284)	0
10-Aug-07	196.25	(0.003561)	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Lampiran 23 : Hasil Backtesting Periode Out of Sample EWMA untuk Propane Spot Periode 1 Juni 2007- 9 Agustus 2007

(dalam USD)

								Backtesting dengan Confidence Level = 99%			
Tanggal	***Actual Price(cents per gallon)***	***Return***	***Forecast Variance dengan EWMA***	***Forecast Volatility dengan EWMA***	**Posisi**	***Cornish Fisher Expansion* (α')**	**Holding Period (hari)**	**VaR**	**Actual P&L**	**-VaR**	**Binary Indicator**
	(a)	**(b)**	**(c)**	**(d)**	**(e)**	**(f)**	**(g)**	**(h) = (d) x (e) x (f) x (g)^0.5**		**(i) = -(h)**	
31-May-07	113.32	-0.014716	0.000155579	0.012473138	47,594	5.196	1	3,084	(29)	(3,084	0
1-Jun-07	113.25	(0.000618)	0.000152493	0.012348801	47,565	5.196	1	3,052	105	(3,052	0
4-Jun-07	113.5	0.002205	0.000149501	0.012227048	47,670	5.196	1	3,028	(420)	(3,028	0
5-Jun-07	112.5	(0.008850)	0.00014826	0.012176202	47,250	5.196	1	2,989	(50)	(2,989	0
6-Jun-07	112.38	(0.001067)	0.000145344	0.012055853	47,200	5.196	1	2,957	(25)	(2,957	0
7-Jun-07	112.32	(0.000534)	0.000142458	0.011935573	47,174	5.196	1	2,925	(344)	(2,925	0
8-Jun-07	111.5	(0.007327)	0.000140831	0.011867220	46,830	5.196	1	2,888	160	(2,888	0
11-Jun-07	111.88	0.003402	0.000138184	0.011755180	46,990	5.196	1	2,870	(130)	(2,870	0
12-Jun-07	111.57	(0.002775)	0.000135633	0.011646172	46,859	5.196	1	2,836	655	(2,836	0
13-Jun-07	113.13	0.013885	0.000136508	0.011683676	47,515	5.196	1	2,884	785	(2,884	0
14-Jun-07	115	0.016395	0.000138826	0.011782452	48,300	5.196	1	2,957	160	(2,957	0
15-Jun-07	115.38	0.003299	0.000136204	0.011670666	48,460	5.196	1	2,938	50	(2,938	0
18-Jun-07	115.5	0.001040	0.000133486	0.011553605	48,510	5.196	1	2,912	-	(2,912	0
19-Jun-07	115.5	-	0.000130821	0.011437719	48,510	5.196	1	2,883	(340)	(2,883	0
20-Jun-07	114.69	(0.007038)	0.000129345	0.011373005	48,170	5.196	1	2,846	290	(2,846	0
21-Jun-07	115.38	0.005998	0.00012736	0.011285406	48,460	5.196	1	2,841	(55)	(2,841	0
22-Jun-07	115.25	(0.001127)	0.000124867	0.011174391	48,405	5.196	1	2,810	(105)	(2,810	0
25-Jun-07	115	(0.002172)	0.000122514	0.011068584	48,300	5.196	1	2,778	(391)	(2,778	0
26-Jun-07	114.07	(0.008120)	0.000121551	0.011025008	47,909	5.196	1	2,744	76	(2,744	0
27-Jun-07	114.25	0.001577	0.000119143	0.010915263	47,985	5.196	1	2,721	265	(2,721	0
28-Jun-07	114.88	0.005499	0.000117259	0.010828633	48,250	5.196	1	2,715	80	(2,715	0
29-Jun-07	115.07	0.001653	0.00011494	0.010721026	48,329	5.196	1	2,692	391	(2,692	0
2-Jul-07	116	0.008050	0.000113778	0.010666694	48,720	5.196	1	2,700	29	(2,700	0
3-Jul-07	116.07	0.000603	0.000111503	0.010559496	48,749	5.196	1	2,675	105	(2,675	0
5-Jul-07	116.32	0.002152	0.000109326	0.010455930	48,854	5.196	1	2,654	155	(2,654	0
6-Jul-07	116.69	0.003176	0.000107281	0.010357673	49,010	5.196	1	2,638	55	(2,638	0
9-Jul-07	116.82	0.001113	0.000105143	0.010253919	49,064	5.196	1	2,614	286	(2,614	0
10-Jul-07	117.5	0.005804	0.000103598	0.010178325	49,350	5.196	1	2,610	160	(2,610	0
11-Jul-07	117.88	0.003229	0.000101673	0.010083284	49,510	5.196	1	2,594	575	(2,594	0
12-Jul-07	119.25	0.011555	0.00010207	0.010102954	50,085	5.196	1	2,629	-	(2,629	0
13-Jul-07	119.25	-	0.000100034	0.010001701	50,085	5.196	1	2,603	420	(2,603	0
16-Jul-07	120.25	0.008351	9.92537E-05	0.009962615	50,505	5.196	1	2,614	(105)	(2,614	0
17-Jul-07	120	(0.002081)	9.74062E-05	0.009869456	50,400	5.196	1	2,584	(181)	(2,584	0
18-Jul-07	119.57	(0.003590)	9.57987E-05	0.009787681	50,219	5.196	1	2,554	286	(2,554	0
19-Jul-07	120.25	0.005671	9.44098E-05	0.009716469	50,505	5.196	1	2,550	-	(2,550	0
20-Jul-07	120.25	-	9.25274E-05	0.009619115	50,505	5.196	1	2,524	(340)	(2,524	0
23-Jul-07	119.44	(0.006759)	9.17407E-05	0.009578136	50,165	5.196	1	2,496	(630)	(2,496	0
24-Jul-07	117.94	(0.012638)	9.33704E-05	0.009662837	49,535	5.196	1	2,487	865	(2,487	0
25-Jul-07	120	0.017316	9.71415E-05	0.009856040	50,400	5.196	1	2,581	-	(2,581	0
26-Jul-07	120	-	9.52044E-05	0.009757273	50,400	5.196	1	2,555	764	(2,555	0
27-Jul-07	121.82	0.015053	9.75127E-05	0.009874854	51,164	5.196	1	2,625	(239)	(2,625	0
30-Jul-07	121.25	(0.004690)	9.61104E-05	0.009803591	50,925	5.196	1	2,594	525	(2,594	0
31-Jul-07	122.5	0.010257	9.60741E-05	0.009801738	51,450	5.196	1	2,620	(365)	(2,620	0
1-Aug-07	121.63	(0.007127)	9.53303E-05	0.009763724	51,085	5.196	1	2,592	155	(2,592	0
2-Aug-07	122	0.003037	9.35481E-05	0.009672027	51,240	5.196	1	2,575	(525)	(2,575	0

								Backtesting dengan Confidence Level = 99%			
Tanggal	***Actual Price(cents per gallon)***	***Return***	***Forecast Variance dengan EWMA***	***Forecast Volatility dengan EWMA***	**Posisi**	***Cornish Fisher Expansion*** (α')	**Holding Period (hari)**	**VaR**	**Actual P&L**	**-VaR**	**Binary Indicator**
	(a)	**(b)**	**(c)**	**(d)**	**(e)**	**(f)**	**(g)**	**(h) = (d) x (e) x (f) x (g)^0.5**		**(i) = -(h)**	
3-Aug-07	120.75	(0.010299)	9.4026E-05	0.009696700	50,715	5.196	1	2,555	(1,680)	(2,555)	0
6-Aug-07	116.75	(0.033687)	0.000115541	0.010748993	49,035	5.196	1	2,739	(105)	(2,739)	0
7-Aug-07	116.5	(0.002144)	0.000113369	0.010647503	48,930	5.196	1	2,707	210	(2,707)	0
8-Aug-07	117	0.004283	0.000111389	0.010554086	49,140	5.196	1	2,695	(340)	(2,695)	0
9-Aug-07	116.19	(0.006947)	0.000110268	0.010500873	48,800	5.196	1	2,663	(185)	(2,663)	0
10-Aug-07	115.75	(0.003794)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Lampiran 24 : Hasil Backtesting Periode Out of Sample EWMA untuk WTI Future Periode 1 Juni 2007- 9 Agustus 2007

(dalam USD)

Tanggal	*Actual Price (dollars/ barrel)*	*Return*	*Forecast Variance dengan EWMA*	*Forecast Volatility dengan EWMA*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
31-May-07	64.01	0.008157	0.000373776	0.019333291	64,010	2.724	1	3,371	1,070	(3,371)	0
1-Jun-07	65.08	0.016578	0.000371466	0.019273456	65,080	2.724	1	3,417	1,130	(3,417)	0
4-Jun-07	66.21	0.017214	0.000369608	0.019225188	66,210	2.724	1	3,467	(600)	(3,467)	0
5-Jun-07	65.61	(0.009103)	0.000364071	0.019080641	65,610	2.724	1	3,410	350	(3,410)	0
6-Jun-07	65.96	0.005320	0.000357249	0.018901042	65,960	2.724	1	3,396	970	(3,396)	0
7-Jun-07	66.93	0.014599	0.00035406	0.018816494	66,930	2.724	1	3,431	(2,170)	(3,431)	0
8-Jun-07	64.76	(0.032959)	0.000369401	0.019219816	64,760	2.724	1	3,391	1,210	(3,391)	0
11-Jun-07	65.97	0.018512	0.000368491	0.019196115	65,970	2.724	1	3,450	(620)	(3,450)	0
12-Jun-07	65.35	(0.009443)	0.000363106	0.019055337	65,350	2.724	1	3,392	910	(3,392)	0
13-Jun-07	66.26	0.013829	0.000359386	0.018957473	66,260	2.724	1	3,422	1,390	(3,422)	0
14-Jun-07	67.65	0.020761	0.000360377	0.018983599	67,650	2.724	1	3,498	350	(3,498)	0
15-Jun-07	68	0.005160	0.000353594	0.018804105	68,000	2.724	1	3,483	1,090	(3,483)	0
18-Jun-07	69.09	0.015902	0.000351229	0.018741116	69,090	2.724	1	3,527	10	(3,527)	0
19-Jun-07	69.1	0.000145	0.000344208	0.018552854	69,100	2.724	1	3,492	(910)	(3,492)	0
20-Jun-07	68.19	(0.013257)	0.000341142	0.018470041	68,190	2.724	1	3,431	460	(3,431)	0
21-Jun-07	68.65	0.006723	0.00033508	0.018305199	68,650	2.724	1	3,423	490	(3,423)	0
22-Jun-07	69.14	0.007112	0.000329237	0.018144886	69,140	2.724	1	3,417	40	(3,417)	0
25-Jun-07	69.18	0.000578	0.000322652	0.017962520	69,180	2.724	1	3,385	(1,410)	(3,385)	0
26-Jun-07	67.77	(0.020592)	0.000325141	0.018031675	67,770	2.724	1	3,329	1,200	(3,329)	0
27-Jun-07	68.97	0.017552	0.00032442	0.018011654	68,970	2.724	1	3,384	600	(3,384)	0
28-Jun-07	69.57	0.008662	0.000319243	0.017867375	69,570	2.724	1	3,386	1,110	(3,386)	0
29-Jun-07	70.68	0.015829	0.000317512	0.017818872	70,680	2.724	1	3,431	410	(3,431)	0
2-Jul-07	71.09	0.005784	0.000311703	0.017655101	71,090	2.724	1	3,419	320	(3,419)	0
3-Jul-07	71.41	0.004491	0.000305773	0.017486368	71,410	2.724	1	3,401	400	(3,401)	0
5-Jul-07	71.81	0.005586	0.000300156	0.017325018	71,810	2.724	1	3,389	1,000	(3,389)	0
6-Jul-07	72.81	0.013830	0.000297653	0.017252617	72,810	2.724	1	3,422	(620)	(3,422)	0
9-Jul-07	72.19	(0.008552)	0.000293376	0.017128214	72,190	2.724	1	3,368	620	(3,368)	0
10-Jul-07	72.81	0.008552	0.000288772	0.016993306	72,810	2.724	1	3,370	(250)	(3,370)	0
11-Jul-07	72.56	(0.003440)	0.000283324	0.016832221	72,560	2.724	1	3,327	(60)	(3,327)	0
12-Jul-07	72.5	(0.000827)	0.000277698	0.016664267	72,500	2.724	1	3,291	1,430	(3,291)	0
13-Jul-07	73.93	0.019532	0.000279307	0.016712486	73,930	2.724	1	3,366	220	(3,366)	0
16-Jul-07	74.15	0.002971	0.000273832	0.016547866	74,150	2.724	1	3,342	(130)	(3,342)	0
17-Jul-07	74.02	(0.001755)	0.000268468	0.016384980	74,020	2.724	1	3,304	1,030	(3,304)	0
18-Jul-07	75.05	0.013819	0.000266582	0.016327347	75,050	2.724	1	3,338	870	(3,338)	0
19-Jul-07	75.92	0.011526	0.000263624	0.016236499	75,920	2.724	1	3,358	(350)	(3,358)	0
20-Jul-07	75.57	(0.004621)	0.000258904	0.016090481	75,570	2.724	1	3,312	(680)	(3,312)	0
23-Jul-07	74.89	(0.009039)	0.000255593	0.015987286	74,890	2.724	1	3,261	(1,330)	(3,261)	0
24-Jul-07	73.56	(0.017919)	0.000257347	0.016042049	73,560	2.724	1	3,214	2,320	(3,214)	0
25-Jul-07	75.88	0.031052	0.000270729	0.016453832	75,880	2.724	1	3,401	(930)	(3,401)	0
26-Jul-07	74.95	(0.012332)	0.00026867	0.016391170	74,950	2.724	1	3,346	2,070	(3,346)	0
27-Jul-07	77.02	0.027244	0.000277464	0.016657251	77,020	2.724	1	3,495	(190)	(3,495)	0
30-Jul-07	76.83	(0.002470)	0.000272108	0.016495700	76,830	2.724	1	3,452	1,380	(3,452)	0
31-Jul-07	78.21	0.017802	0.000272552	0.016509161	78,210	2.724	1	3,517	(1,680)	(3,517)	0
1-Aug-07	76.53	(0.021715)	0.000277098	0.016646264	76,530	2.724	1	3,470	330	(3,470)	0
2-Aug-07	76.86	0.004303	0.000271826	0.016487135	76,860	2.724	1	3,452	(1,380)	(3,452)	0

Tanggal	*Actual Price (dollars/ barrel)*	*Return*	*Forecast Variance dengan EWMA*	*Forecast Volatility dengan EWMA*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
3-Aug-07	75.48	(0.018118)	0.000273413	0.016535214	75,480	2.724	1	3,400	(3,420)	(3,400)	1
6-Aug-07	72.06	(0.046369)	0.000312043	0.017664738	72,060	2.724	1	3,467	360	(3,467)	0
7-Aug-07	72.42	0.004983	0.000306193	0.017498357	72,420	2.724	1	3,452	(270)	(3,452)	0
8-Aug-07	72.15	(0.003735)	0.000300438	0.017333161	72,150	2.724	1	3,407	(560)	(3,407)	0
9-Aug-07	71.59	(0.007792)	0.000295824	0.017199539	71,590	2.724	1	3,354	(120)	(3,354)	0
10-Aug-07	71.47	(0.001678)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Lampiran 25 : Hasil Backtesting Periode Out of Sample EWMA untuk Heating Oil Future Periode 1 Juni 2007- 9 Agustus 2007

(dalam USD)

Tanggal	*Actual Price(cents per gallon)*	*Return*	*Forecast Variance dengan EWMA*	*Forecast Volatility dengan EWMA*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5			
31-May-07	188.27	0.003832	0.000344336	0.018556281	79,073	2.831	1	4,154	1,684	(4,154	0
1-Jun-07	192.28	0.021076	0.000345864	0.018597419	80,758	2.831	1	4,252	1,756	(4,252	0
4-Jun-07	196.46	0.021506	0.000347701	0.018646735	82,513	2.831	1	4,356	(8	(4,356	0
5-Jun-07	196.44	(0.000102)	0.000340756	0.018459588	82,505	2.831	1	4,312	391	(4,312	0
6-Jun-07	197.37	0.004723	0.000334282	0.018283376	82,895	2.831	1	4,291	113	(4,291	0
7-Jun-07	197.64	0.001367	0.000327608	0.018099945	83,009	2.831	1	4,254	(3,259	(4,254	0
8-Jun-07	189.88	(0.040055)	0.000354074	0.018816856	79,750	2.831	1	4,249	1,273	(4,249	0
11-Jun-07	192.91	0.015831	0.000351655	0.018752472	81,022	2.831	1	4,302	(638	(4,302	0
12-Jun-07	191.39	(0.007911)	0.000346059	0.018602666	80,384	2.831	1	4,234	2,020	(4,234	0
13-Jun-07	196.2	0.024821	0.000350896	0.018732228	82,404	2.831	1	4,370	2,272	(4,370	0
14-Jun-07	201.61	0.027201	0.000358029	0.018921665	84,676	2.831	1	4,536	(231	(4,536	0
15-Jun-07	201.06	(0.002732)	0.000351092	0.018737461	84,445	2.831	1	4,480	991	(4,480	0
18-Jun-07	203.42	0.011669	0.000346514	0.018614893	85,436	2.831	1	4,503	(311	(4,503	0
19-Jun-07	202.68	(0.003644)	0.000339947	0.018437662	85,126	2.831	1	4,444	298	(4,444	0
20-Jun-07	203.39	0.003497	0.000333314	0.018256897	85,424	2.831	1	4,416	(386	(4,416	0
21-Jun-07	202.47	(0.004534)	0.000327178	0.018088067	85,037	2.831	1	4,355	559	(4,355	0
22-Jun-07	203.8	0.006547	0.000321338	0.017925916	85,596	2.831	1	4,344	185	(4,344	0
25-Jun-07	204.24	0.002157	0.000314959	0.017747084	85,781	2.831	1	4,310	(2,062	(4,310	0
26-Jun-07	199.33	(0.024334)	0.000321099	0.017919234	83,719	2.831	1	4,247	1,315	(4,247	0
27-Jun-07	202.46	0.015581	0.000319166	0.017865210	85,033	2.831	1	4,301	(265	(4,301	0
28-Jun-07	201.83	(0.003117)	0.000313059	0.017693483	84,769	2.831	1	4,247	571	(4,247	0
29-Jun-07	203.19	0.006716	0.000307545	0.017536958	85,340	2.831	1	4,237	1,256	(4,237	0
2-Jul-07	206.18	0.014608	0.00030531	0.017473118	86,596	2.831	1	4,284	185	(4,284	0
3-Jul-07	206.62	0.002132	0.000299249	0.017298820	86,780	2.831	1	4,250	886	(4,250	0
5-Jul-07	208.73	0.010160	0.000295081	0.017177935	87,667	2.831	1	4,264	328	(4,264	0
6-Jul-07	209.51	0.003730	0.000289371	0.017010923	87,994	2.831	1	4,238	(97	(4,238	0
9-Jul-07	209.28	(0.001098)	0.000283644	0.016841735	87,898	2.831	1	4,191	1,302	(4,191	0
10-Jul-07	212.38	0.014704	0.000281927	0.016790695	89,200	2.831	1	4,241	(966	(4,241	0
11-Jul-07	210.08	(0.010889)	0.000278947	0.016701705	88,234	2.831	1	4,172	(214	(4,172	0
12-Jul-07	209.57	(0.002431)	0.000273555	0.016539513	88,019	2.831	1	4,122	626	(4,122	0
13-Jul-07	211.06	0.007085	0.000268917	0.016398689	88,645	2.831	1	4,116	(2,310	(4,116	0
16-Jul-07	205.56	(0.026404)	0.000278146	0.016677707	86,335	2.831	1	4,077	(941	(4,077	0
17-Jul-07	203.32	(0.010957)	0.000275254	0.016590786	85,394	2.831	1	4,011	3,016	(4,011	0
18-Jul-07	210.5	0.034705	0.000292996	0.017117123	88,410	2.831	1	4,285	391	(4,285	0
19-Jul-07	211.43	0.004408	0.000287421	0.016953507	88,801	2.831	1	4,263	(928	(4,263	0
20-Jul-07	209.22	(0.010508)	0.000284152	0.016856812	87,872	2.831	1	4,194	(1,516	(4,194	0
23-Jul-07	205.61	(0.017405)	0.00028496	0.016880759	86,356	2.831	1	4,127	(1,058	(4,127	0
24-Jul-07	203.09	(0.012332)	0.000282602	0.016810775	85,298	2.831	1	4,060	1,470	(4,060	0
25-Jul-07	206.59	0.017087	0.00028239	0.016804456	86,768	2.831	1	4,128	(1,390	(4,128	0
26-Jul-07	203.28	(0.016152)	0.000282351	0.016803295	85,378	2.831	1	4,062	1,693	(4,062	0
27-Jul-07	207.31	0.019631	0.000283951	0.016850836	87,070	2.831	1	4,154	(336	(4,154	0
30-Jul-07	206.51	(0.003866)	0.000278671	0.016693445	86,734	2.831	1	4,099	1,466	(4,099	0
31-Jul-07	210	0.016759	0.000278314	0.016682757	88,200	2.831	1	4,166	(1,285	(4,166	0
1-Aug-07	206.94	(0.014679)	0.000277422	0.016655985	86,915	2.831	1	4,099	218	(4,099	0
2-Aug-07	207.46	0.002510	0.000271946	0.016490793	87,133	2.831	1	4,068	(1,705	(4,068	0

Tanggal	*Actual Price(cents per gallon)*	*Return*	*Forecast Variance dengan EWMA*	*Forecast Volatility dengan EWMA*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5			
3-Aug-07	203.4	(0.019764)	0.000274794	0.016576904	85,428	2.831	1	4,010	(3,977)	(4,010)	0
6-Aug-07	193.93	(0.047677)	0.000315825	0.017771455	81,451	2.831	1	4,098	1,042	(4,098)	0
7-Aug-07	196.41	0.012707	0.000312471	0.017676838	82,492	2.831	1	4,129	113	(4,129)	0
8-Aug-07	196.68	0.001374	0.000306235	0.017499571	82,606	2.831	1	4,093	941	(4,093)	0
9-Aug-07	198.92	0.011325	0.000302432	0.017390582	83,546	2.831	1	4,114	(756)	(4,114)	0
10-Aug-07	197.12	(0.009090)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Lampiran 26 : Hasil Backtesting Periode Out of Sample ARCH/GARCH untuk WTI Spot Periode 1 Juni 2007- 9 Agustus 2007

(dalam USD)

Tanggal	*Actual Price (dollars/barrel)*	*Return*	*Forecast Variance dengan GARCH*	*Forecast Volatility dengan GARCH*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
31/May/07	64.02	0.008628	0.000351776	0.018755705	64,020	2.740	1	3,289	1,070	(3,289)	0
01/Jun/07	65.09	0.016575	0.000381865	0.019541368	65,090	2.740	1	3,485	1,080	(3,485)	0
04/Jun/07	66.17	0.016456	0.00041413	0.020350183	66,170	2.740	1	3,689	(540)	(3,689)	0
05/Jun/07	65.63	(0.008194)	0.000368678	0.019200998	65,630	2.740	1	3,452	340	(3,452)	0
06/Jun/07	65.97	0.005167	0.000330011	0.018166202	65,970	2.740	1	3,283	960	(3,283)	0
07/Jun/07	66.93	0.014447	0.000369914	0.019233148	66,930	2.740	1	3,527	(2,150)	(3,527)	0
08/Jun/07	64.78	(0.032650)	0.00045364	0.021298827	64,780	2.740	1	3,780	1,150	(3,780)	0
11/Jun/07	65.93	0.017597	0.00040147	0.020036704	65,930	2.740	1	3,619	(570)	(3,619)	0
12/Jun/07	65.36	(0.008683)	0.000324281	0.018007796	65,360	2.740	1	3,224	810	(3,224)	0
13/Jun/07	66.17	0.012317	0.00036988	0.019232275	66,170	2.740	1	3,486	1,450	(3,486)	0
14/Jun/07	67.62	0.021677	0.000442825	0.021043408	67,620	2.740	1	3,898	420	(3,898)	0
15/Jun/07	68.04	0.006192	0.000374298	0.019346783	68,040	2.740	1	3,606	1,020	(3,606)	0
18/Jun/07	69.06	0.014880	0.000318921	0.017858352	69,060	2.740	1	3,379	90	(3,379)	0
19/Jun/07	69.15	0.001302	0.000366316	0.019139393	69,150	2.740	1	3,626	(650)	(3,626)	0
20/Jun/07	68.5	(0.009444)	0.000397184	0.019929479	68,500	2.740	1	3,740	(150)	(3,740)	0
21/Jun/07	68.35	(0.002192)	0.000332683	0.018239599	68,350	2.740	1	3,415	500	(3,415)	0
22/Jun/07	68.85	0.007289	0.00030313	0.017410628	68,850	2.740	1	3,284	(20)	(3,284)	0
25/Jun/07	68.83	(0.000291)	0.000346319	0.018609648	68,830	2.740	1	3,509	(1,050)	(3,509)	0
26/Jun/07	67.78	(0.015373)	0.000368484	0.019195945	67,780	2.740	1	3,564	1,200	(3,564)	0
27/Jun/07	68.98	0.017549	0.00032835	0.018120434	68,980	2.740	1	3,424	630	(3,424)	0
28/Jun/07	69.61	0.009092	0.00030519	0.017469689	69,610	2.740	1	3,331	860	(3,331)	0
29/Jun/07	70.47	0.012279	0.00033834	0.018394021	70,470	2.740	1	3,551	640	(3,551)	0
02/Jul/07	71.11	0.009041	0.000342182	0.018498153	71,110	2.740	1	3,604	300	(3,604)	0
03/Jul/07	71.41	0.004210	0.000299938	0.017318705	71,410	2.740	1	3,388	400	(3,388)	0
05/Jul/07	71.81	0.005586	0.000289824	0.017024206	71,810	2.740	1	3,349	990	(3,349)	0
06/Jul/07	72.8	0.013692	0.000325843	0.018051126	72,800	2.740	1	3,600	(660)	(3,600)	0
09/Jul/07	72.14	(0.009107)	0.000320513	0.017902875	72,140	2.740	1	3,538	660	(3,538)	0
10/Jul/07	72.8	0.009107	0.000279711	0.016724569	72,800	2.740	1	3,336	(220)	(3,336)	0
11/Jul/07	72.58	(0.003027)	0.000277808	0.016667581	72,580	2.740	1	3,314	(30)	(3,314)	0
12/Jul/07	72.55	(0.000413)	0.000300558	0.017336606	72,550	2.740	1	3,446	1,340	(3,446)	0
13/Jul/07	73.89	0.018302	0.000305918	0.017490516	73,890	2.740	1	3,541	220	(3,541)	0
16/Jul/07	74.11	0.002973	0.000272515	0.016508031	74,110	2.740	1	3,352	(80)	(3,352)	0
17/Jul/07	74.03	(0.001080)	0.000260389	0.016136574	74,030	2.740	1	3,273	1,000	(3,273)	0
18/Jul/07	75.03	0.013418	0.000289705	0.017020727	75,030	2.740	1	3,499	870	(3,499)	0
19/Jul/07	75.9	0.011529	0.000291152	0.017063175	75,900	2.740	1	3,548	(370)	(3,548)	0
20/Jul/07	75.53	(0.004887)	0.000254374	0.015949117	75,530	2.740	1	3,300	(880)	(3,300)	0
23/Jul/07	74.65	(0.011719)	0.000259266	0.016101736	74,650	2.740	1	3,293	(1,270)	(3,293)	0
24/Jul/07	73.38	(0.017159)	0.000303357	0.017417153	73,380	2.740	1	3,501	2,360	(3,501)	0
25/Jul/07	75.74	0.031655	0.000344375	0.018557337	75,740	2.740	1	3,851	(780)	(3,851)	0
26/Jul/07	74.96	(0.010352)	0.000294046	0.017147777	74,960	2.740	1	3,521	2,070	(3,521)	0
27/Jul/07	77.03	0.027240	0.000302564	0.017394358	77,030	2.740	1	3,671	(210)	(3,671)	0
30/Jul/07	76.82	(0.002730)	0.000330603	0.018182487	76,820	2.740	1	3,827	1,380	(3,827)	0
31/Jul/07	78.2	0.017805	0.000324757	0.018021022	78,200	2.740	1	3,861	(1,710)	(3,861)	0
01/Aug/07	76.49	(0.022110)	0.000320553	0.017903990	76,490	2.740	1	3,752	350	(3,752)	0

Tanggal	*Actual Price (dollars/barrel)*	*Return*	*Forecast Variance dengan GARCH*	*Forecast Volatility dengan GARCH*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
02/Aug/07	76.84	0.004565	0.000309916	0.017604418	76,840	2.740	1	3,706	(1,430)	(3,706)	0
03/Aug/07	75.41	(0.018785)	0.000327708	0.018102720	75,410	2.740	1	3,740	(3,380)	(3,740)	0
06/Aug/07	72.03	(0.045857)	0.000482486	0.021965560	72,030	2.740	1	4,334	220	(4,334)	0
07/Aug/07	72.25	0.003050	0.000420419	0.020504110	72,250	2.740	1	4,058	(20)	(4,058)	0
08/Aug/07	72.23	(0.000277)	0.000282635	0.016811754	72,230	2.740	1	3,327	(610)	(3,327)	0
09/Aug/07	71.62	(0.008481)	0.000340729	0.018458849	71,620	2.740	1	3,622	(130)	(3,622)	0
10/Aug/07	71.49	(0.001817)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Lampiran 27 : Hasil Backtesting Periode Out of Sample ARCH/GARCH untuk Heating Oil Spot Periode 1 Juni 2007- 9 Agustus 2007

(dalam USD)

Tanggal	*Actual Price(cents per gallon)*	*Return*	*Forecast Variance dengan GARCH*	*Forecast Volatility dengan GARCH*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
31/May/07	189.15	0.010096	0.000465117	0.021566567	79,443	3.778	1	6,473	1,365	(6,473)	0
01/Jun/07	192.4	0.017036	0.000460088	0.021449658	80,808	3.778	1	6,549	1,714	(6,549)	0
04/Jun/07	196.48	0.020984	0.000470379	0.021688231	82,522	3.778	1	6,762	206	(6,762)	0
05/Jun/07	196.97	0.002491	0.000455092	0.021332875	82,727	3.778	1	6,668	315	(6,668)	0
06/Jun/07	197.72	0.003800	0.000430578	0.020750363	83,042	3.778	1	6,511	(34)	(6,511)	0
07/Jun/07	197.64	(0.000405)	0.000404353	0.020108538	83,009	3.778	1	6,307	(3,112)	(6,307)	0
08/Jun/07	190.23	(0.038213)	0.000495506	0.022259961	79,897	3.778	1	6,720	1,071	(6,720)	0
11/Jun/07	192.78	0.013316	0.000521066	0.022826872	80,968	3.778	1	6,983	(529)	(6,983)	0
12/Jun/07	191.52	(0.006557)	0.000509931	0.022581655	80,438	3.778	1	6,863	2,020	(6,863)	0
13/Jun/07	196.33	0.024805	0.000520684	0.022818491	82,459	3.778	1	7,109	2,339	(7,109)	0
14/Jun/07	201.9	0.027976	0.000555831	0.023576059	84,798	3.778	1	7,553	(353)	(7,553)	0
15/Jun/07	201.06	(0.004169)	0.000541937	0.023279538	84,445	3.778	1	7,427	815	(7,427)	0
18/Jun/07	203	0.009603	0.000511798	0.022622944	85,260	3.778	1	7,288	(248)	(7,288)	0
19/Jun/07	202.41	(0.002911)	0.000473791	0.021766750	85,012	3.778	1	6,991	311	(6,991)	0
20/Jun/07	203.15	0.003649	0.000436361	0.020889253	85,323	3.778	1	6,734	(286)	(6,734)	0
21/Jun/07	202.47	(0.003353)	0.000404731	0.020117930	85,037	3.778	1	6,464	601	(6,464)	0
22/Jun/07	203.9	0.007038	0.000380796	0.019514008	85,638	3.778	1	6,314	29	(6,314)	0
25/Jun/07	203.97	0.000343	0.000360636	0.018990409	85,667	3.778	1	6,147	(1,684)	(6,147)	0
26/Jun/07	199.96	(0.019856)	0.000378168	0.019446551	83,983	3.778	1	6,171	1,151	(6,171)	0
27/Jun/07	202.7	0.013610	0.000387101	0.019674894	85,134	3.778	1	6,329	(248)	(6,329)	0
28/Jun/07	202.11	(0.002915)	0.000381604	0.019534688	84,886	3.778	1	6,265	59	(6,265)	0
29/Jun/07	202.25	0.000692	0.000369398	0.019219741	84,945	3.778	1	6,168	1,588	(6,168)	0
02/Jul/07	206.03	0.018517	0.000379115	0.019470871	86,533	3.778	1	6,366	126	(6,366)	0
03/Jul/07	206.33	0.001455	0.000373491	0.019325913	86,659	3.778	1	6,328	806	(6,328)	0
05/Jul/07	208.25	0.009262	0.000367118	0.019160315	87,465	3.778	1	6,332	357	(6,332)	0
06/Jul/07	209.1	0.004073	0.000356509	0.018881445	87,822	3.778	1	6,265	(374)	(6,265)	0
09/Jul/07	208.21	(0.004265)	0.000346438	0.018612846	87,448	3.778	1	6,150	1,260	(6,150)	0
10/Jul/07	211.21	0.014306	0.000348944	0.018680046	88,708	3.778	1	6,261	(928)	(6,261)	0
11/Jul/07	209	(0.010519)	0.000352717	0.018780750	87,780	3.778	1	6,229	84	(6,229)	0
12/Jul/07	209.2	0.000956	0.000346842	0.018623703	87,864	3.778	1	6,183	479	(6,183)	0
13/Jul/07	210.34	0.005435	0.000338881	0.018408731	88,343	3.778	1	6,144	(2,180)	(6,144)	0
16/Jul/07	205.15	(0.024984)	0.000382008	0.019545021	86,163	3.778	1	6,363	(941)	(6,363)	0
17/Jul/07	202.91	(0.010979)	0.000402105	0.020052565	85,222	3.778	1	6,457	2,390	(6,457)	0
18/Jul/07	208.6	0.027656	0.000450482	0.021224560	87,612	3.778	1	7,026	601	(7,026)	0
19/Jul/07	210.03	0.006832	0.000455409	0.021340305	88,213	3.778	1	7,112	(567)	(7,112)	0
20/Jul/07	208.68	(0.006448)	0.000441522	0.021012416	87,646	3.778	1	6,958	(1,546)	(6,958)	0
23/Jul/07	205	(0.017792)	0.000444497	0.021083102	86,100	3.778	1	6,858	(1,289)	(6,858)	0
24/Jul/07	201.93	(0.015089)	0.000447972	0.021165350	84,811	3.778	1	6,782	1,982	(6,782)	0
25/Jul/07	206.65	0.023105	0.000465227	0.021569120	86,793	3.778	1	7,073	(1,596)	(7,073)	0
26/Jul/07	202.85	(0.018560)	0.000477613	0.021854353	85,197	3.778	1	7,035	1,617	(7,035)	0
27/Jul/07	206.7	0.018802	0.000482013	0.021954786	86,814	3.778	1	7,201	(294)	(7,201)	0
30/Jul/07	206	(0.003392)	0.000461414	0.021480548	86,520	3.778	1	7,022	1,470	(7,022)	0
31/Jul/07	209.5	0.016848	0.000449648	0.021204896	87,990	3.778	1	7,050	(1,617)	(7,050)	0
01/Aug/07	205.65	(0.018548)	0.000451563	0.021250004	86,373	3.778	1	6,935	(71)	(6,935)	0
02/Aug/07	205.48	(0.000827)	0.000433019	0.020809110	86,302	3.778	1	6,785	(1,840)	(6,785)	0
03/Aug/07	201.1	(0.021546)	0.000445532	0.021107633	84,462	3.778	1	6,736	(3,452)	(6,736)	0

Tanggal	*Actual Price(cents per gallon)*	*Return*	*Forecast Variance dengan GARCH*	*Forecast Volatility dengan GARCH*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
06/Aug/07	192.88	(0.041734)	0.000573589	0.023949724	81,010	3.778	1	7,330	609	(7,330)	0
07/Aug/07	194.33	0.007490	0.000597046	0.024434520	81,619	3.778	1	7,535	512	(7,535)	0
08/Aug/07	195.55	0.006258	0.000572607	0.023929199	82,131	3.778	1	7,425	588	(7,425)	0
09/Aug/07	196.95	0.007134	0.00053022	0.023026514	82,719	3.778	1	7,197	(294)	(7,197)	0
10/Aug/07	196.25	(0.003561)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Lampiran 28 : Hasil Backtesting Periode Out of Sample ARCH/GARCH untuk Propane Spot Periode 1 Juni 2007- 9 Agustus 2007

(dalam USD)

Tanggal	*Actual Price(cents per gallon)*	*Return*	*Forecast Variance dengan GARCH*	*Forecast Volatility dengan GARCH*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
31/May/07	113.32	-0.014716	0.000238203	0.015433839	47,594	5.196	1	3,817	(29)	(3,817)	0
01/Jun/07	113.25	(0.000618)	0.000287702	0.016961778	47,565	5.196	1	4,192	105	(4,192)	0
04/Jun/07	113.5	0.002205	0.000239689	0.015481881	47,670	5.196	1	3,835	(420)	(3,835)	0
05/Jun/07	112.5	(0.008850)	0.000214595	0.014649060	47,250	5.196	1	3,596	(50)	(3,596)	0
06/Jun/07	112.38	(0.001067)	0.00023681	0.015388628	47,200	5.196	1	3,774	(25)	(3,774)	0
07/Jun/07	112.32	(0.000534)	0.000208488	0.014439103	47,174	5.196	1	3,539	(344)	(3,539)	0
08/Jun/07	111.5	(0.007327)	0.000199456	0.014122895	46,830	5.196	1	3,436	160	(3,436)	0
11/Jun/07	111.88	0.003402	0.000211354	0.014538021	46,990	5.196	1	3,549	(130)	(3,549)	0
12/Jun/07	111.57	(0.002775)	0.000193989	0.013927998	46,859	5.196	1	3,391	655	(3,391)	0
13/Jun/07	113.13	0.013885	0.000220933	0.014863815	47,515	5.196	1	3,670	785	(3,670)	0
14/Jun/07	115	0.016395	0.000273398	0.016534744	48,300	5.196	1	4,149	160	(4,149)	0
15/Jun/07	115.38	0.003299	0.000228258	0.015108219	48,460	5.196	1	3,804	50	(3,804)	0
18/Jun/07	115.5	0.001040	0.00018313	0.013532557	48,510	5.196	1	3,411	-	(3,411)	0
19/Jun/07	115.5	-	0.000207353	0.014399764	48,510	5.196	1	3,629	(340)	(3,629)	0
20/Jun/07	114.69	(0.007038)	0.000215605	0.014683499	48,170	5.196	1	3,675	290	(3,675)	0
21/Jun/07	115.38	0.005998	0.000192256	0.013865645	48,460	5.196	1	3,491	(55)	(3,491)	0
22/Jun/07	115.25	(0.001127)	0.000185437	0.013617541	48,405	5.196	1	3,425	(105)	(3,425)	0
25/Jun/07	115	(0.002172)	0.000189485	0.013765353	48,300	5.196	1	3,454	(391)	(3,454)	0
26/Jun/07	114.07	(0.008120)	0.000197249	0.014044528	47,909	5.196	1	3,496	76	(3,496)	0
27/Jun/07	114.25	0.001577	0.000187874	0.013706730	47,985	5.196	1	3,417	265	(3,417)	0
28/Jun/07	114.88	0.005499	0.000177426	0.013320137	48,250	5.196	1	3,339	80	(3,339)	0
29/Jun/07	115.07	0.001653	0.000178654	0.013366148	48,329	5.196	1	3,356	391	(3,356)	0
02/Jul/07	116	0.008050	0.000184897	0.013597677	48,720	5.196	1	3,442	29	(3,442)	0
03/Jul/07	116.07	0.000603	0.000177057	0.013306290	48,749	5.196	1	3,370	105	(3,370)	0
05/Jul/07	116.32	0.002152	0.000166052	0.012886126	48,854	5.196	1	3,271	155	(3,271)	0
06/Jul/07	116.69	0.003176	0.00016855	0.012982680	49,010	5.196	1	3,306	55	(3,306)	0
09/Jul/07	116.82	0.001113	0.000166654	0.012909439	49,064	5.196	1	3,291	286	(3,291)	0
10/Jul/07	117.5	0.005804	0.000164615	0.012830254	49,350	5.196	1	3,290	160	(3,290)	0
11/Jul/07	117.88	0.003229	0.000164645	0.012831389	49,510	5.196	1	3,301	575	(3,301)	0
12/Jul/07	119.25	0.011555	0.00018627	0.013648094	50,085	5.196	1	3,552	-	(3,552)	0
13/Jul/07	119.25	-	0.000182435	0.013506863	50,085	5.196	1	3,515	420	(3,515)	0
16/Jul/07	120.25	0.008351	0.000171101	0.013080551	50,505	5.196	1	3,433	(105)	(3,433)	0
17/Jul/07	120	(0.002081)	0.00017803	0.013342774	50,400	5.196	1	3,494	(181)	(3,494)	0
18/Jul/07	119.57	(0.003590)	0.000174616	0.013214238	50,219	5.196	1	3,448	286	(3,448)	0
19/Jul/07	120.25	0.005671	0.000168533	0.012982019	50,505	5.196	1	3,407	-	(3,407)	0
20/Jul/07	120.25	-	0.000166301	0.012895765	50,505	5.196	1	3,384	(340)	(3,384)	0
23/Jul/07	119.44	(0.006759)	0.000175207	0.013236562	50,165	5.196	1	3,450	(630)	(3,450)	0
24/Jul/07	117.94	(0.012638)	0.000212202	0.014567165	49,535	5.196	1	3,749	865	(3,749)	0
25/Jul/07	120	0.017316	0.000266214	0.016316065	50,400	5.196	1	4,273	-	(4,273)	0
26/Jul/07	120	-	0.000226704	0.015056690	50,400	5.196	1	3,943	764	(3,943)	0
27/Jul/07	121.82	0.015053	0.000220708	0.014856255	51,164	5.196	1	3,949	(239)	(3,949)	0
30/Jul/07	121.25	(0.004690)	0.000250575	0.015829562	50,925	5.196	1	4,188	525	(4,188)	0
31/Jul/07	122.5	0.010257	0.000224208	0.014973578	51,450	5.196	1	4,003	(365)	(4,003)	0
01/Aug/07	121.63	(0.007127)	0.000212406	0.014574143	51,085	5.196	1	3,868	155	(3,868)	0
02/Aug/07	122	0.003037	0.000211457	0.014541573	51,240	5.196	1	3,871	(525)	(3,871)	0
03/Aug/07	120.75	(0.010299)	0.000218055	0.014766673	50,715	5.196	1	3,891	(1,680)	(3,891)	0

Tanggal	*Actual Price(cents per gallon)*	*Return*	*Forecast Variance dengan GARCH*	*Forecast Volatility dengan GARCH*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
06/Aug/07	116.75	(0.033687)	0.00047862	0.021877377	49,035	5.196	1	5,574	(105)	(5,574)	0
07/Aug/07	116.5	(0.002144)	0.000442124	0.021026736	48,930	5.196	1	5,346	210	(5,346)	0
08/Aug/07	117	0.004283	0.000183409	0.013542862	49,140	5.196	1	3,458	(340)	(3,458)	0
09/Aug/07	116.19	(0.006947)	0.00027301	0.016523001	48,800	5.196	1	4,189	(185)	(4,189)	0
10/Aug/07	115.75	(0.003794)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Lampiran 29 : Hasil Backtesting Periode Out of Sample ARCH/GARCH untuk WTI Future Periode 1 Juni 2007- 9 Agustus 2007

(dalam USD)

Tanggal	*Actual Price (dollars/barrel)*	*Return*	*Forecast Variance dengan GARCH*	*Forecast Volatility dengan GARCH*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
31/May/07	64.01	0.008157	0.000456968	0.021376813	64,010	2.724	1	3,727	1,070	(3,727)	0
01/Jun/07	65.08	0.016578	0.000413145	0.020325957	65,080	2.724	1	3,603	1,130	(3,603)	0
04/Jun/07	66.21	0.017214	0.000415724	0.020389321	66,210	2.724	1	3,677	(600)	(3,677)	0
05/Jun/07	65.61	(0.009103)	0.000396712	0.019917627	65,610	2.724	1	3,560	350	(3,560)	0
06/Jun/07	65.96	0.005320	0.000389387	0.019732894	65,960	2.724	1	3,546	970	(3,546)	0
07/Jun/07	66.93	0.014599	0.000377967	0.019441374	66,930	2.724	1	3,545	(2,170)	(3,545)	0
08/Jun/07	64.76	(0.032959)	0.000440695	0.020992733	64,760	2.724	1	3,703	1,210	(3,703)	0
11/Jun/07	65.97	0.018512	0.000388415	0.019708240	65,970	2.724	1	3,542	(620)	(3,542)	0
12/Jun/07	65.35	(0.009443)	0.000415796	0.020391076	65,350	2.724	1	3,630	910	(3,630)	0
13/Jun/07	66.26	0.013829	0.00038372	0.019588771	66,260	2.724	1	3,536	1,390	(3,536)	0
14/Jun/07	67.65	0.020761	0.000413135	0.020325727	67,650	2.724	1	3,746	350	(3,746)	0
15/Jun/07	68	0.005160	0.000371245	0.019267711	68,000	2.724	1	3,569	1,090	(3,569)	0
18/Jun/07	69.09	0.015902	0.000399065	0.019976616	69,090	2.724	1	3,760	10	(3,760)	0
19/Jun/07	69.1	0.000145	0.000359268	0.018954369	69,100	2.724	1	3,568	(910)	(3,568)	0
20/Jun/07	68.19	(0.013257)	0.000384687	0.019613448	68,190	2.724	1	3,643	460	(3,643)	0
21/Jun/07	68.65	0.006723	0.000348559	0.018669729	68,650	2.724	1	3,491	490	(3,491)	0
22/Jun/07	69.14	0.007112	0.000362571	0.019041299	69,140	2.724	1	3,586	40	(3,586)	0
25/Jun/07	69.18	0.000578	0.0003346	0.018292082	69,180	2.724	1	3,447	(1,410)	(3,447)	0
26/Jun/07	67.77	(0.020592)	0.000370901	0.019258792	67,770	2.724	1	3,555	1,200	(3,555)	0
27/Jun/07	68.97	0.017552	0.000344444	0.018559194	68,970	2.724	1	3,487	600	(3,487)	0
28/Jun/07	69.57	0.008662	0.000352769	0.018782151	69,570	2.724	1	3,559	1,110	(3,559)	0
29/Jun/07	70.68	0.015829	0.000345446	0.018586170	70,680	2.724	1	3,578	410	(3,578)	0
02/Jul/07	71.09	0.005784	0.00033749	0.018370889	71,090	2.724	1	3,558	320	(3,558)	0
03/Jul/07	71.41	0.004491	0.000328857	0.018134423	71,410	2.724	1	3,528	400	(3,528)	0
05/Jul/07	71.81	0.005586	0.00032154	0.017931535	71,810	2.724	1	3,508	1,000	(3,508)	0
06/Jul/07	72.81	0.013830	0.000323693	0.017991470	72,810	2.724	1	3,568	(620)	(3,568)	0
09/Jul/07	72.19	(0.008552)	0.000313195	0.017697316	72,190	2.724	1	3,480	620	(3,480)	0
10/Jul/07	72.81	0.008552	0.000311577	0.017651542	72,810	2.724	1	3,501	(250)	(3,501)	0
11/Jul/07	72.56	(0.003440)	0.000301391	0.017360619	72,560	2.724	1	3,431	(60)	(3,431)	0
12/Jul/07	72.5	(0.000827)	0.000295984	0.017204192	72,500	2.724	1	3,398	1,430	(3,398)	0
13/Jul/07	73.93	0.019532	0.000310549	0.017622402	73,930	2.724	1	3,549	220	(3,549)	0
16/Jul/07	74.15	0.002971	0.000287312	0.016950278	74,150	2.724	1	3,424	(130)	(3,424)	0
17/Jul/07	74.02	(0.001755)	0.000292624	0.017106269	74,020	2.724	1	3,449	1,030	(3,449)	0
18/Jul/07	75.05	0.013819	0.00028694	0.016939301	75,050	2.724	1	3,463	870	(3,463)	0
19/Jul/07	75.92	0.011526	0.000287539	0.016956983	75,920	2.724	1	3,507	(350)	(3,507)	0
20/Jul/07	75.57	(0.004621)	0.000276858	0.016639052	75,570	2.724	1	3,425	(680)	(3,425)	0
23/Jul/07	74.89	(0.009039)	0.000279876	0.016729481	74,890	2.724	1	3,413	(1,330)	(3,413)	0
24/Jul/07	73.56	(0.017919)	0.00029196	0.017086826	73,560	2.724	1	3,424	2,320	(3,424)	0
25/Jul/07	75.88	0.031052	0.000333265	0.018255559	75,880	2.724	1	3,773	(930)	(3,773)	0
26/Jul/07	74.95	(0.012332)	0.000300335	0.017330173	74,950	2.724	1	3,538	2,070	(3,538)	0
27/Jul/07	77.02	0.027244	0.000360859	0.018996291	77,020	2.724	1	3,985	(190)	(3,985)	0
30/Jul/07	76.83	(0.002470)	0.000301151	0.017353705	76,830	2.724	1	3,632	1,380	(3,632)	0
31/Jul/07	78.21	0.017802	0.000348532	0.018669005	78,210	2.724	1	3,977	(1,680)	(3,977)	0
01/Aug/07	76.53	(0.021715)	0.000332699	0.018240050	76,530	2.724	1	3,802	330	(3,802)	0
02/Aug/07	76.86	0.004303	0.000328897	0.018135531	76,860	2.724	1	3,797	(1,380)	(3,797)	0
03/Aug/07	75.48	(0.018118)	0.000337356	0.018367242	75,480	2.724	1	3,776	(3,420)	(3,776)	0

Tanggal	*Actual Price (dollars/barrel)*	*Return*	*Forecast Variance dengan GARCH*	*Forecast Volatility dengan GARCH*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
06/Aug/07	72.06	(0.046369)	0.000476165	0.021821213	72,060	2.724	1	4,283	360	(4,283)	0
07/Aug/07	72.42	0.004983	0.000345388	0.018584615	72,420	2.724	1	3,666	(270)	(3,666)	0
08/Aug/07	72.15	(0.003735)	0.000420952	0.020517115	72,150	2.724	1	4,032	(560)	(4,032)	0
09/Aug/07	71.59	(0.007792)	0.00035056	0.018723240	71,590	2.724	1	3,651	(120)	(3,651)	0
10/Aug/07	71.47	(0.001678)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Lampiran 30 : Hasil Backtesting Periode Out of Sample ARCH/GARCH untuk Heating Oil Future Periode 1 Juni 2007- 9 Agustus 2007

(dalam USD)

Tanggal	*Actual Price(cents per gallon)*	*Return*	*Forecast Variance dengan GARCH*	*Forecast Volatility dengan GARCH*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
31/May/07	188.27	0.003832	0.000456223	0.021359368	79,073	2.831	1	4,782	1,684	(4,782)	0
01/Jun/07	192.28	0.021076	0.000462675	0.021509874	80,758	2.831	1	4,918	1,756	(4,918)	0
04/Jun/07	196.46	0.021506	0.000449458	0.021200413	82,513	2.831	1	4,953	(8)	(4,953)	0
05/Jun/07	196.44	(0.000102)	0.000450197	0.021217857	82,505	2.831	1	4,956	391	(4,956)	0
06/Jun/07	197.37	0.004723	0.000391957	0.019797912	82,895	2.831	1	4,647	113	(4,647)	0
07/Jun/07	197.64	0.001367	0.000428811	0.020707752	83,009	2.831	1	4,867	(3,259)	(4,867)	0
08/Jun/07	189.88	(0.040055)	0.000518629	0.022773423	79,750	2.831	1	5,142	1,273	(5,142)	0
11/Jun/07	192.91	0.015831	0.000486637	0.022059842	81,022	2.831	1	5,061	(638)	(5,061)	0
12/Jun/07	191.39	(0.007911)	0.0004257	0.020632500	80,384	2.831	1	4,696	2,020	(4,696)	0
13/Jun/07	196.2	0.024821	0.000540221	0.023242648	82,404	2.831	1	5,423	2,272	(5,423)	0
14/Jun/07	201.61	0.027201	0.000456363	0.021362664	84,676	2.831	1	5,122	(231)	(5,122)	0
15/Jun/07	201.06	(0.002732)	0.000518774	0.022776610	84,445	2.831	1	5,446	991	(5,446)	0
18/Jun/07	203.42	0.011669	0.000405651	0.020140773	85,436	2.831	1	4,872	(311)	(4,872)	0
19/Jun/07	202.68	(0.003644)	0.000492484	0.022191979	85,126	2.831	1	5,349	298	(5,349)	0
20/Jun/07	203.39	0.003497	0.000363901	0.019076200	85,424	2.831	1	4,614	(386)	(4,614)	0
21/Jun/07	202.47	(0.004534)	0.000456655	0.021369476	85,037	2.831	1	5,145	559	(5,145)	0
22/Jun/07	203.8	0.006547	0.000343704	0.018539266	85,596	2.831	1	4,493	185	(4,493)	0
25/Jun/07	204.24	0.002157	0.000419028	0.020470178	85,781	2.831	1	4,972	(2,062)	(4,972)	0
26/Jun/07	199.33	(0.024334)	0.00038888	0.019720039	83,719	2.831	1	4,674	1,315	(4,674)	0
27/Jun/07	202.46	0.015581	0.000426707	0.020656881	85,033	2.831	1	4,973	(265)	(4,973)	0
28/Jun/07	201.83	(0.003117)	0.000356473	0.018880487	84,769	2.831	1	4,531	571	(4,531)	0
29/Jun/07	203.19	0.006716	0.000401285	0.020032102	85,340	2.831	1	4,840	1,256	(4,840)	0
02/Jul/07	206.18	0.014608	0.00035325	0.018794959	86,596	2.831	1	4,608	185	(4,608)	0
03/Jul/07	206.62	0.002132	0.000379418	0.019478648	86,780	2.831	1	4,786	886	(4,786)	0
05/Jul/07	208.73	0.010160	0.0003372	0.018363015	87,667	2.831	1	4,558	328	(4,558)	0
06/Jul/07	209.51	0.003730	0.000359829	0.018969147	87,994	2.831	1	4,726	(97)	(4,726)	0
09/Jul/07	209.28	(0.001098)	0.000315291	0.017756437	87,898	2.831	1	4,419	1,302	(4,419)	0
10/Jul/07	212.38	0.014704	0.000358899	0.018944617	89,200	2.831	1	4,785	(966)	(4,785)	0
11/Jul/07	210.08	(0.010889)	0.000319491	0.017874312	88,234	2.831	1	4,465	(214)	(4,465)	0
12/Jul/07	209.57	(0.002431)	0.000335684	0.018321674	88,019	2.831	1	4,566	626	(4,566)	0
13/Jul/07	211.06	0.007085	0.000310578	0.017623236	88,645	2.831	1	4,423	(2,310)	(4,423)	0
16/Jul/07	205.56	(0.026404)	0.000388596	0.019712832	86,335	2.831	1	4,819	(941)	(4,819)	0
17/Jul/07	203.32	(0.010957)	0.000342512	0.018507072	85,394	2.831	1	4,475	3,016	(4,475)	0
18/Jul/07	210.5	0.034705	0.000455739	0.021348048	88,410	2.831	1	5,344	391	(5,344)	0
19/Jul/07	211.43	0.004408	0.000385214	0.019626866	88,801	2.831	1	4,935	(928)	(4,935)	0
20/Jul/07	209.22	(0.010508)	0.000381071	0.019521035	87,872	2.831	1	4,857	(1,516)	(4,857)	0
23/Jul/07	205.61	(0.017405)	0.000433683	0.020825048	86,356	2.831	1	5,092	(1,058)	(5,092)	0
24/Jul/07	203.09	(0.012332)	0.000354029	0.018815661	85,298	2.831	1	4,544	1,470	(4,544)	0
25/Jul/07	206.59	0.017087	0.000443753	0.021065443	86,768	2.831	1	5,175	(1,390)	(5,175)	0
26/Jul/07	203.28	(0.016152)	0.000353606	0.018804428	85,378	2.831	1	4,546	1,693	(4,546)	0
27/Jul/07	207.31	0.019631	0.000450452	0.021223845	87,070	2.831	1	5,232	(336)	(5,232)	0
30/Jul/07	206.51	(0.003866)	0.000339364	0.018421835	86,734	2.831	1	4,524	1,466	(4,524)	0
31/Jul/07	210	0.016759	0.000428645	0.020703734	88,200	2.831	1	5,170	(1,285)	(5,170)	0
01/Aug/07	206.94	(0.014679)	0.00035819	0.018925901	86,915	2.831	1	4,657	218	(4,657)	0
02/Aug/07	207.46	0.002510	0.000387055	0.019673711	87,133	2.831	1	4,854	(1,705)	(4,854)	0

Tanggal	*Actual Price(cents per gallon)*	*Return*	*Forecast Variance dengan GARCH*	*Forecast Volatility dengan GARCH*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
03/Aug/07	203.4	(0.019764)	0.000383171	0.019574762	85,428	2.831	1	4,735	(3,977)	(4,735)	0
06/Aug/07	193.93	(0.047677)	0.000609527	0.024688597	81,451	2.831	1	5,694	1,042	(5,694)	0
07/Aug/07	196.41	0.012707	0.000456301	0.021361195	82,492	2.831	1	4,989	113	(4,989)	0
08/Aug/07	196.68	0.001374	0.000473942	0.021770219	82,606	2.831	1	5,092	941	(5,092)	0
09/Aug/07	198.92	0.011325	0.000480531	0.021921012	83,546	2.831	1	5,185	(756)	(5,185)	0
10/Aug/07	197.12	(0.009090)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Lampiran 31 : Perhitungan Volatilitas Propane Future Menggunakan Standar Deviasi Normal
Periode 31 Mei 2007- 9 Agustus 2007

Tanggal	*Return*	*Forecast Volatility*
	(a)	
Jan 04, 2000	-0.063789738	N/A
Jan 05, 2000	0	N/A
Jan 06, 2000	0.046792162	N/A
Jan 07, 2000	0	N/A
Jan 10, 2000	-0.005730675	N/A
Jan 11, 2000	0.011428696	N/A
Jan 12, 2000	0.044234348	N/A
Jan 13, 2000	0.032305729	N/A
Jan 14, 2000	0.020834087	N/A
Jan 18, 2000	0.107420249	N/A
Jan 19, 2000	-0.009302393	N/A
Jan 20, 2000	0.049235103	N/A
Jan 21, 2000	0.022868191	N/A
Jan 24, 2000	0	N/A
Jan 25, 2000	-0.004357305	N/A
Jan 26, 2000	0.076961041	N/A
Jan 27, 2000	0.084028335	N/A
Jan 28, 2000	-0.081282633	N/A
Jan 31, 2000	-0.018065427	N/A
May 31, 2007	-0.010953012	0.0219821
Jun 01, 2007	0	0.0219761
Jun 04, 2007	0	0.0219702
Jun 05, 2007	-0.004415018	0.0219645
Jun 06, 2007	-0.004434597	0.0219589
Jun 07, 2007	0.004434597	0.0219532
Jun 08, 2007	-0.006659292	0.0219479
Jun 11, 2007	-0.002229655	0.0219420
Jun 12, 2007	0	0.0219361
Jun 13, 2007	0.013303966	0.0219322
Jun 14, 2007	0.010953012	0.0219276
Jun 15, 2007	0.006514681	0.0219222
Jun 18, 2007	0.004319661	0.0219165
Jun 19, 2007	0	0.0219106
Jun 20, 2007	-0.008658063	0.0219057
Jun 21, 2007	0.004338402	0.0219000
Jun 22, 2007	0.002162163	0.0218942
Jun 25, 2007	-0.008676844	0.0218893
Jun 26, 2007	0	0.0218834
Jun 27, 2007	0	0.0218776
Jun 28, 2007	0.010834342	0.0218730
Jun 29, 2007	-0.002157498	0.0218672
Jul 02, 2007	0.002157498	0.0218614
Jul 03, 2007	0.004301082	0.0218558
Jul 05, 2007	0	0.0218499
Jul 06, 2007	0.002143624	0.0218441
Jul 09, 2007	0.004273511	0.0218384
Jul 10, 2007	0.006376217	0.0218330
Jul 11, 2007	0.002116403	0.0218272
Jul 12, 2007	0.006322466	0.0218218
Jul 13, 2007	0.01252626	0.0218178
Jul 16, 2007	0.004140793	0.0218121
Jul 17, 2007	-0.008298803	0.0218073
Jul 18, 2007	0	0.0218015

Tanggal	*Return*	*Forecast Volatility*
	(a)	
Jul 19, 2007	0.00415801	0.0217958
Jul 20, 2007	0	0.0217900
Jul 23, 2007	-0.002076844	0.0217843
Jul 24, 2007	-0.014659948	0.0217813
Jul 25, 2007	0.008403411	0.0217763
Jul 26, 2007	0.016597891	0.0217737
Jul 27, 2007	-0.002059733	0.0217680
Jul 30, 2007	0	0.0217622
Jul 31, 2007	0.006166515	0.0217569
Aug 01, 2007	0.004089985	0.0217513
Aug 02, 2007	0	0.0217455
Aug 03, 2007	-0.002042902	0.0217398
Aug 06, 2007	-0.020661892	0.0217395
Aug 07, 2007	-0.018967903	0.0217384
Aug 08, 2007	0	0.0217327
Aug 09, 2007	-0.003410063	0.0217271

Lampiran 32 : Hasil Backtesting Periode Out of Sample Standar Deviasi Normal untuk Propane Future Periode 1 Juni 2007- 9 Agustus 2007

(dalam USD)

Tanggal	*Actual Price(cents per gallon)*	*Return*	*Forecast Variance dengan GARCH*	*Forecast Volatility dengan GARCH*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
31/May/07	113.5	-0.010953	0.000483211	0.021982068	47,670	3.499	1	3,667	-	(3,667)	0
01/Jun/07	113.5	-	0.00048295	0.021976120	47,670	3.499	1	3,666	-	(3,666)	0
04/Jun/07	113.5	-	0.000482689	0.021970177	47,670	3.499	1	3,665	(210)	(3,665)	0
05/Jun/07	113	(0.004415)	0.000482441	0.021964533	47,460	3.499	1	3,648	(210)	(3,648)	0
06/Jun/07	112.5	(0.004435)	0.000482193	0.021958895	47,250	3.499	1	3,631	210	(3,631)	0
07/Jun/07	113	0.004435	0.000481941	0.021953153	47,460	3.499	1	3,646	(315)	(3,646)	0
08/Jun/07	112.25	(0.006659)	0.000481708	0.021947856	47,145	3.499	1	3,621	(105)	(3,621)	0
11/Jun/07	112	(0.002230)	0.000481452	0.021942025	47,040	3.499	1	3,612	-	(3,612)	0
12/Jun/07	112	-	0.000481193	0.021936110	47,040	3.499	1	3,611	630	(3,611)	0
13/Jun/07	113.5	0.013304	0.000481022	0.021932211	47,670	3.499	1	3,659	525	(3,659)	0
14/Jun/07	114.75	0.010953	0.000480821	0.021927642	48,195	3.499	1	3,698	315	(3,698)	0
15/Jun/07	115.5	0.006515	0.000480582	0.021922180	48,510	3.499	1	3,721	210	(3,721)	0
18/Jun/07	116	0.004320	0.000480331	0.021916457	48,720	3.499	1	3,736	-	(3,736)	0
19/Jun/07	116	-	0.000480073	0.021910565	48,720	3.499	1	3,735	(420)	(3,735)	0
20/Jun/07	115	(0.008658)	0.00047986	0.021905706	48,300	3.499	1	3,702	210	(3,702)	0
21/Jun/07	115.5	0.004338	0.00047961	0.021900000	48,510	3.499	1	3,718	105	(3,718)	0
22/Jun/07	115.75	0.002162	0.000479354	0.021894152	48,615	3.499	1	3,725	(420)	(3,725)	0
25/Jun/07	114.75	(0.008677)	0.000479142	0.021889310	48,195	3.499	1	3,692	-	(3,692)	0
26/Jun/07	114.75	-	0.000478885	0.021883441	48,195	3.499	1	3,691	-	(3,691)	0
27/Jun/07	114.75	-	0.000478628	0.021877576	48,195	3.499	1	3,690	525	(3,690)	0
28/Jun/07	116	0.010834	0.000478429	0.021873019	48,720	3.499	1	3,729	(105)	(3,729)	0
29/Jun/07	115.75	(0.002157)	0.000478177	0.021867248	48,615	3.499	1	3,720	105	(3,720)	0
02/Jul/07	116	0.002157	0.000477922	0.021861427	48,720	3.499	1	3,727	210	(3,727)	0
03/Jul/07	116.5	0.004301	0.000477674	0.021855753	48,930	3.499	1	3,742	-	(3,742)	0
05/Jul/07	116.5	-	0.000477419	0.021849912	48,930	3.499	1	3,741	105	(3,741)	0
06/Jul/07	116.75	0.002144	0.000477165	0.021844105	49,035	3.499	1	3,748	210	(3,748)	0
09/Jul/07	117.25	0.004274	0.000476918	0.021838442	49,245	3.499	1	3,763	315	(3,763)	0
10/Jul/07	118	0.006376	0.000476681	0.021833031	49,560	3.499	1	3,786	105	(3,786)	0
11/Jul/07	118.25	0.002116	0.000476428	0.021827236	49,665	3.499	1	3,793	315	(3,793)	0
12/Jul/07	119	0.006322	0.000476192	0.021821826	49,980	3.499	1	3,817	630	(3,817)	0
13/Jul/07	120.5	0.012526	0.000476015	0.021817768	50,610	3.499	1	3,864	210	(3,864)	0
16/Jul/07	121	0.004141	0.000475768	0.021812114	50,820	3.499	1	3,879	(420)	(3,879)	0
17/Jul/07	120	(0.008299)	0.000475556	0.021807258	50,400	3.499	1	3,846	-	(3,846)	0
18/Jul/07	120	-	0.000475304	0.021801457	50,400	3.499	1	3,845	210	(3,845)	0
19/Jul/07	120.5	0.004158	0.000475058	0.021795819	50,610	3.499	1	3,860	-	(3,860)	0
20/Jul/07	120.5	-	0.000474805	0.021790028	50,610	3.499	1	3,859	(105)	(3,859)	0
23/Jul/07	120.25	(0.002077)	0.000474557	0.021784321	50,505	3.499	1	3,850	(735)	(3,850)	0

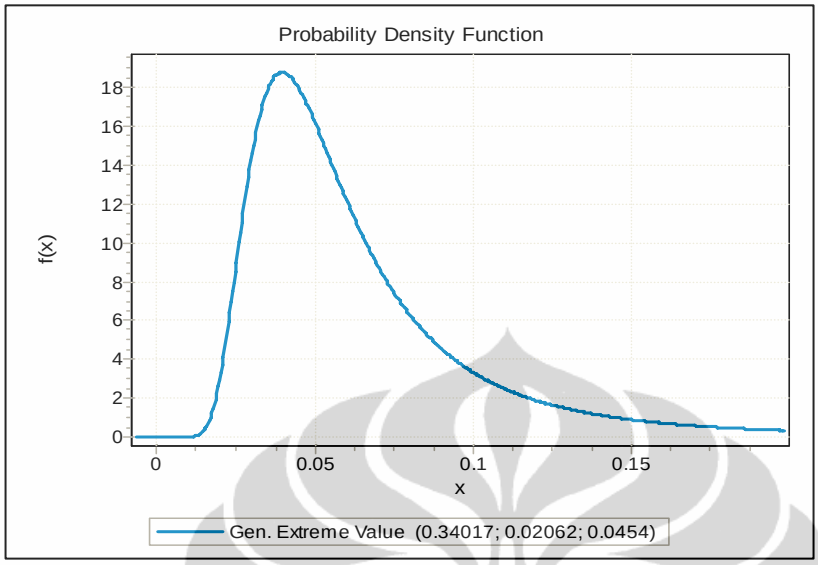
Tanggal	*Actual Price(cents per gallon)*	*Return*	*Forecast Variance dengan GARCH*	*Forecast Volatility dengan GARCH*	Posisi	*Cornish Fisher Expansion* (α')	Holding Period (hari)	Backtesting dengan Confidence Level = 99%			
								VaR	Actual P&L	-VaR	Binary Indicator
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h) = (d) x (e) x (f) x (g)^0.5		(i) = -(h)	
24/Jul/07	118.5	(0.014660)	0.000474427	0.021781347	49,770	3.499	1	3,793	420	(3,793)	0
25/Jul/07	119.5	0.008403	0.000474208	0.021776322	50,190	3.499	1	3,825	840	(3,825)	0
26/Jul/07	121.5	0.016598	0.000474094	0.021773691	51,030	3.499	1	3,888	(105)	(3,888)	0
27/Jul/07	121.25	(0.002060)	0.000473846	0.021768000	50,925	3.499	1	3,879	-	(3,879)	0
30/Jul/07	121.25	-	0.000473595	0.021762235	50,925	3.499	1	3,878	315	(3,878)	0
31/Jul/07	122	0.006167	0.000473361	0.021756857	51,240	3.499	1	3,901	210	(3,901)	0
01/Aug/07	122.5	0.004090	0.000473117	0.021751251	51,450	3.499	1	3,916	-	(3,916)	0
02/Aug/07	122.5	-	0.000472867	0.021745500	51,450	3.499	1	3,915	(105)	(3,915)	0
03/Aug/07	122.25	(0.002043)	0.00047262	0.021739830	51,345	3.499	1	3,906	(1,050)	(3,906)	0
06/Aug/07	119.75	(0.020662)	0.000472608	0.021739543	50,295	3.499	1	3,826	(945)	(3,826)	0
07/Aug/07	117.5	(0.018968)	0.000472559	0.021738414	49,350	3.499	1	3,754	-	(3,754)	0
08/Aug/07	117.5	-	0.000472309	0.021732678	49,350	3.499	1	3,753	(168)	(3,753)	0
09/Aug/07	117.1	(0.003410)	0.000472068	0.021727130	49,182	3.499	1	3,739	(882)	(3,739)	0
10/Aug/07	115	(0.018096)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Lampiran 33 : Hasil Estimasi Parameter Distribusi GEV WTI Spot

No (a)	Minima Data (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.40640	0.993902	0.4039	0.987842	0.40145
2	0.17255	0.981707	0.1694	0.963749	0.16630
3	0.17092	0.969512	0.1657	0.939954	0.16065
4	0.15191	0.957317	0.1454	0.916456	0.13922
5	0.14086	0.945122	0.1331	0.893256	0.12582
60	0.04110	0.274390	0.0113	0.075290	0.00309
61	0.04099	0.262195	0.0107	0.068746	0.00282
62	0.04063	0.250000	0.0102	0.062500	0.00254
63	0.04062	0.237805	0.0097	0.056551	0.00230
64	0.04009	0.225610	0.0090	0.050900	0.00204
65	0.03971	0.213415	0.0085	0.045546	0.00181
66	0.03933	0.201220	0.0079	0.040489	0.00159
67	0.03888	0.189024	0.0074	0.035730	0.00139
68	0.03572	0.176829	0.0063	0.031269	0.00112
69	0.03495	0.164634	0.0058	0.027104	0.00095
70	0.03406	0.152439	0.0052	0.023238	0.00079
71	0.03390	0.140244	0.0048	0.019668	0.00067
72	0.03368	0.128049	0.0043	0.016396	0.00055
73	0.03296	0.115854	0.0038	0.013422	0.00044
74	0.03251	0.103659	0.0034	0.010745	0.00035
75	0.03185	0.091463	0.0029	0.008366	0.00027
76	0.03104	0.079268	0.0025	0.006283	0.00020
77	0.03082	0.067073	0.0021	0.004499	0.00014
78	0.02671	0.054878	0.0015	0.003012	0.00008
79	0.02536	0.042683	0.0011	0.001822	0.00005
80	0.02147	0.030488	0.0007	0.000930	0.00002
81	0.02004	0.018293	0.0004	0.000335	0.00001
82	0.01728	0.006098	0.0001	0.000037	0.00000
	0.06761		0.04469		0.03486
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.02176
m2	0.03697
c	0.04234
Shape	0.32746
Location	0.04577
Scale	0.02081
VaR	**0.2689**



Sumber : Data EIA, diolah dengan EasyFit Professional

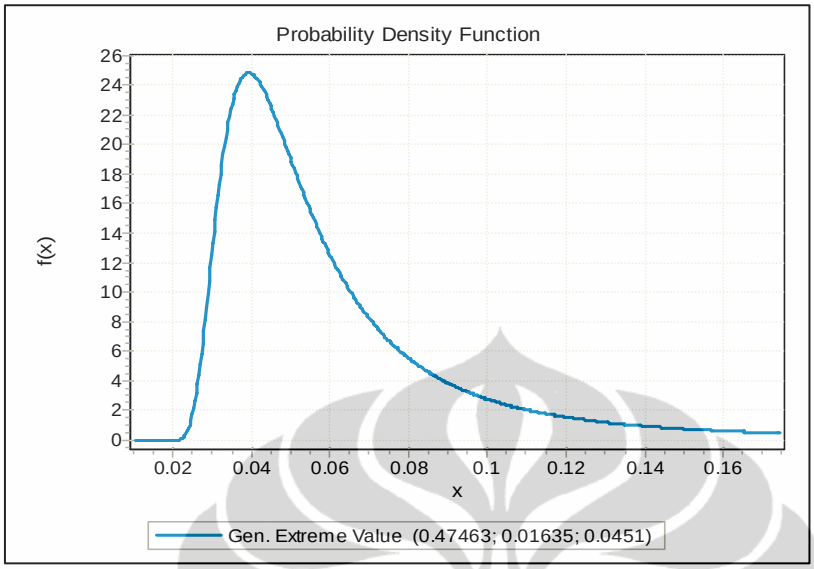
Shape	0.34017
Scale	0.02062
Location	0.0454
VaR	**0.27468**

Lampiran 34 : Hasil Estimasi Parameter Distribusi GEV Heating Oil Spot

No (a)	Minima Data (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.47012	0.993902	0.4673	0.987842	0.46440
2	0.40468	0.981707	0.3973	0.963749	0.39001
3	0.15545	0.969512	0.1507	0.939954	0.14612
4	0.15462	0.957317	0.1480	0.916456	0.14170
5	0.13015	0.945122	0.1230	0.893256	0.11626
60	0.04342	0.274390	0.0119	0.075290	0.00327
61	0.04306	0.262195	0.0113	0.068746	0.00296
62	0.04253	0.250000	0.0106	0.062500	0.00266
63	0.04230	0.237805	0.0101	0.056551	0.00239
64	0.04205	0.225610	0.0095	0.050900	0.00214
65	0.04038	0.213415	0.0086	0.045546	0.00184
66	0.04023	0.201220	0.0081	0.040489	0.00163
67	0.03979	0.189024	0.0075	0.035730	0.00142
68	0.03920	0.176829	0.0069	0.031269	0.00123
69	0.03772	0.164634	0.0062	0.027104	0.00102
70	0.03720	0.152439	0.0057	0.023238	0.00086
71	0.03542	0.140244	0.0050	0.019668	0.00070
72	0.03512	0.128049	0.0045	0.016396	0.00058
73	0.03412	0.115854	0.0040	0.013422	0.00046
74	0.03350	0.103659	0.0035	0.010745	0.00036
75	0.03161	0.091463	0.0029	0.008366	0.00026
76	0.03131	0.079268	0.0025	0.006283	0.00020
77	0.03091	0.067073	0.0021	0.004499	0.00014
78	0.02709	0.054878	0.0015	0.003012	0.00008
79	0.02692	0.042683	0.0011	0.001822	0.00005
80	0.02662	0.030488	0.0008	0.000930	0.00002
81	0.02484	0.018293	0.0005	0.000335	0.00001
82	0.02225	0.006098	0.0001	0.000037	0.00000
	0.06884		0.04562		0.03601
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.02239
m2	0.03920
c	0.05969
Shape	0.45856
Location	0.04547
Scale	0.01673
VaR	**0.3097**



Sumber : Data EIA, diolah dengan EasyFit Professional

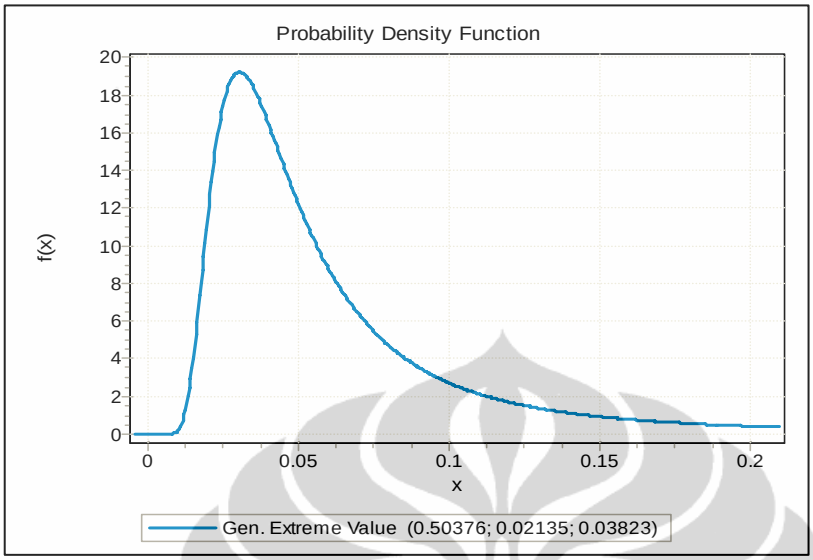
Shape	0.47463
Scale	0.01635
Location	0.0451
VaR	**0.31649**

Lampiran 35 : Hasil Estimasi Parameter Distribusi GEV Propane Spot

No (a)	Minima Data (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.49861	0.99074	0.49400	0.98157	0.48942
2	0.39756	0.97222	0.38652	0.94522	0.37578
3	0.21936	0.95370	0.20921	0.90955	0.19952
4	0.14316	0.93519	0.13388	0.87457	0.12520
5	0.12783	0.91667	0.11718	0.84028	0.10742
6	0.11155	0.89815	0.10019	0.80667	0.08999
7	0.10244	0.87963	0.09011	0.77375	0.07926
8	0.10099	0.86111	0.08697	0.74151	0.07489
9	0.08956	0.84259	0.07546	0.70996	0.06358
10	0.08673	0.82407	0.07147	0.67910	0.05890
11	0.08646	0.80556	0.06965	0.64892	0.05611
12	0.08552	0.78704	0.06731	0.61943	0.05297
13	0.08469	0.76852	0.06508	0.59062	0.05002
14	0.08303	0.75000	0.06227	0.56250	0.04670
15	0.07829	0.73148	0.05727	0.53507	0.04189
16	0.07400	0.71296	0.05276	0.50832	0.03762
17	0.07033	0.69444	0.04884	0.48225	0.03392
18	0.06971	0.67593	0.04712	0.45688	0.03185
19	0.06218	0.65741	0.04088	0.43218	0.02687
20	0.05959	0.63889	0.03807	0.40818	0.02432
21	0.05499	0.62037	0.03411	0.38486	0.02116
22	0.05423	0.60185	0.03264	0.36223	0.01964
23	0.05367	0.58333	0.03131	0.34028	0.01826
24	0.05334	0.56481	0.03013	0.31902	0.01702
25	0.04861	0.54630	0.02656	0.29844	0.01451
26	0.04517	0.52778	0.02384	0.27855	0.01258
27	0.04465	0.50926	0.02274	0.25934	0.01158
28	0.04461	0.49074	0.02189	0.24083	0.01074
29	0.04271	0.47222	0.02017	0.22299	0.00952
30	0.04223	0.45370	0.01916	0.20585	0.00869
31	0.04222	0.43519	0.01837	0.18939	0.00800
32	0.04161	0.41667	0.01734	0.17361	0.00722
33	0.04092	0.39815	0.01629	0.15852	0.00649
34	0.04020	0.37963	0.01526	0.14412	0.00579
35	0.03974	0.36111	0.01435	0.13040	0.00518
36	0.03968	0.34259	0.01359	0.11737	0.00466
37	0.03861	0.32407	0.01251	0.10502	0.00406
38	0.03850	0.30556	0.01176	0.09336	0.00359
39	0.03731	0.28704	0.01071	0.08239	0.00307
40	0.03612	0.26852	0.00970	0.07210	0.00260
41	0.03454	0.25000	0.00864	0.06250	0.00216
42	0.03394	0.23148	0.00786	0.05358	0.00182
43	0.03261	0.21296	0.00694	0.04535	0.00148
44	0.03125	0.19444	0.00608	0.03781	0.00118
45	0.03101	0.17593	0.00546	0.03095	0.00096
46	0.02632	0.15741	0.00414	0.02478	0.00065
47	0.02608	0.13889	0.00362	0.01929	0.00050
48	0.02419	0.12037	0.00291	0.01449	0.00035
49	0.02400	0.10185	0.00244	0.01037	0.00025
50	0.02374	0.08333	0.00198	0.00694	0.00016
51	0.02048	0.06481	0.00133	0.00420	0.00009
52	0.01882	0.04630	0.00087	0.00214	0.00004
53	0.01632	0.02778	0.00045	0.00077	0.00001
54	0.00855	0.00926	0.00008	0.00009	0.00000
	0.07153		0.05129		0.04204
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.03104
m2	0.05460
c	0.06233
Shape	0.47840
Location	0.03900
Scale	0.02221
VaR	**0.4118**



Sumber : Data EIA, diolah dengan EasyFit Professional

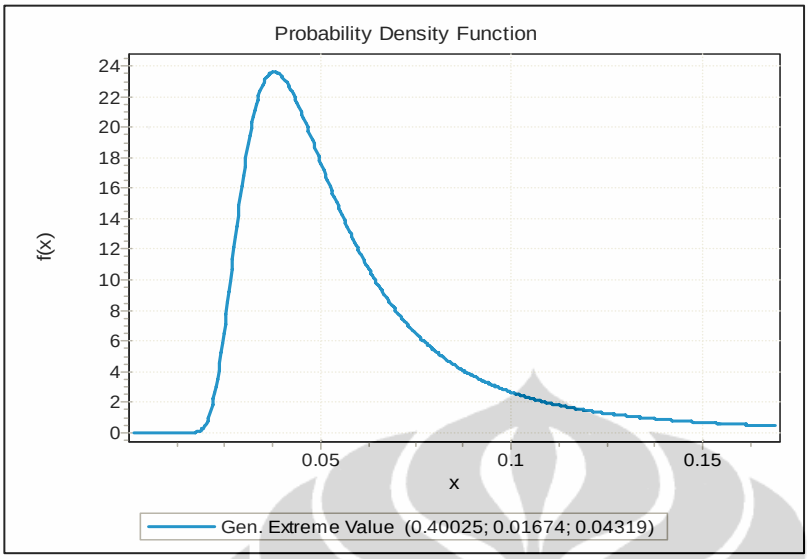
Shape	0.50376
Scale	0.02135
Location	0.03823
VaR	**0.42601**

Lampiran 36 : Hasil Estimasi Parameter Distribusi GEV WTI Future

No (a)	Minima Data (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.40048	0.99390	0.39804	0.98784	0.39561
2	0.17448	0.98171	0.17129	0.96375	0.16816
3	0.16545	0.96951	0.16040	0.93995	0.15551
4	0.14513	0.95732	0.13894	0.91646	0.13301
5	0.13858	0.94512	0.13098	0.89326	0.12379
60	0.04043	0.27439	0.01109	0.07529	0.00304
61	0.04027	0.26220	0.01056	0.06875	0.00277
62	0.03960	0.25000	0.00990	0.06250	0.00248
63	0.03910	0.23780	0.00930	0.05655	0.00221
64	0.03839	0.22561	0.00866	0.05090	0.00195
65	0.03816	0.21341	0.00814	0.04555	0.00174
66	0.03794	0.20122	0.00763	0.04049	0.00154
67	0.03719	0.18902	0.00703	0.03573	0.00133
68	0.03715	0.17683	0.00657	0.03127	0.00116
69	0.03664	0.16463	0.00603	0.02710	0.00099
70	0.03483	0.15244	0.00531	0.02324	0.00081
71	0.03412	0.14024	0.00478	0.01967	0.00067
72	0.03409	0.12805	0.00436	0.01640	0.00056
73	0.03286	0.11585	0.00381	0.01342	0.00044
74	0.03270	0.10366	0.00339	0.01075	0.00035
75	0.03241	0.09146	0.00296	0.00837	0.00027
76	0.02993	0.07927	0.00237	0.00628	0.00019
77	0.02920	0.06707	0.00196	0.00450	0.00013
78	0.02836	0.05488	0.00156	0.00301	0.00009
79	0.02828	0.04268	0.00121	0.00182	0.00005
80	0.02264	0.03049	0.00069	0.00093	0.00002
81	0.02101	0.01829	0.00038	0.00033	0.00001
82	0.01960	0.00610	0.00012	0.00004	0.00000
	0.06367		0.04167		0.03252
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.01968
m2	0.03388
c	0.05008
Shape	0.38615
Location	0.04353
Scale	0.01698
VaR	**0.2593**



Sumber : Data EIA, diolah dengan EasyFit Professional

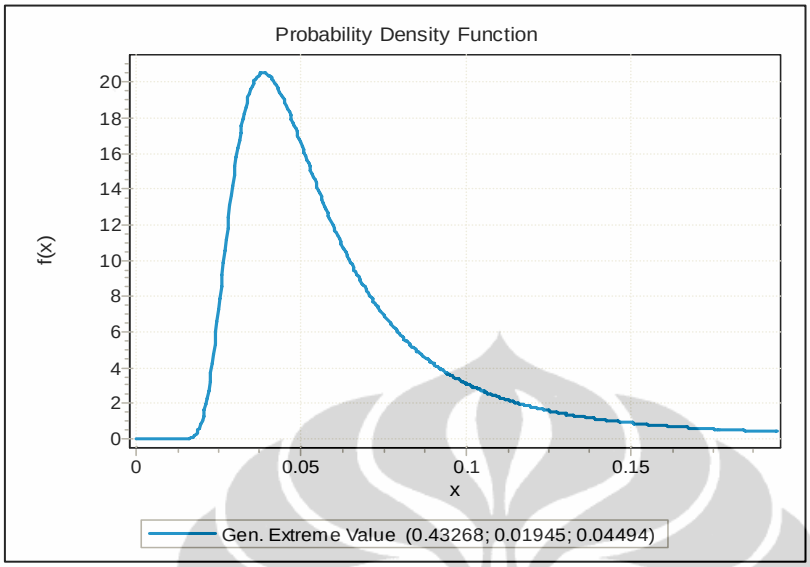
Shape	0.40025
Scale	0.01674
Location	0.04319
VaR	**0.26500**

Lampiran 37 : Hasil Estimasi Parameter Distribusi GEV Heating Oil Future

No (a)	Minima Data (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.39094	0.99390	0.38856	0.98784	0.38619
2	0.27484	0.98171	0.26981	0.96375	0.26488
3	0.20971	0.96951	0.20332	0.93995	0.19712
4	0.19249	0.95732	0.18427	0.91646	0.17640
5	0.15243	0.94512	0.14406	0.89326	0.13616
60	0.04113	0.27439	0.01129	0.07529	0.00310
61	0.04111	0.26220	0.01078	0.06875	0.00283
62	0.04088	0.25000	0.01022	0.06250	0.00255
63	0.04027	0.23780	0.00958	0.05655	0.00228
64	0.04012	0.22561	0.00905	0.05090	0.00204
65	0.03979	0.21341	0.00849	0.04555	0.00181
66	0.03965	0.20122	0.00798	0.04049	0.00161
67	0.03936	0.18902	0.00744	0.03573	0.00141
68	0.03750	0.17683	0.00663	0.03127	0.00117
69	0.03727	0.16463	0.00614	0.02710	0.00101
70	0.03682	0.15244	0.00561	0.02324	0.00086
71	0.03399	0.14024	0.00477	0.01967	0.00067
72	0.03371	0.12805	0.00432	0.01640	0.00055
73	0.03365	0.11585	0.00390	0.01342	0.00045
74	0.03278	0.10366	0.00340	0.01075	0.00035
75	0.03127	0.09146	0.00286	0.00837	0.00026
76	0.02919	0.07927	0.00231	0.00628	0.00018
77	0.02824	0.06707	0.00189	0.00450	0.00013
78	0.02725	0.05488	0.00150	0.00301	0.00008
79	0.02624	0.04268	0.00112	0.00182	0.00005
80	0.02539	0.03049	0.00077	0.00093	0.00002
81	0.02319	0.01829	0.00042	0.00033	0.00001
82	0.02034	0.00610	0.00012	0.00004	0.00000
	0.07053		0.04745		0.03760
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.02437
m2	0.04227
c	0.05427
Shape	0.41779
Location	0.04535
Scale	0.01980
VaR	**0.32179**



Sumber : Data EIA, diolah dengan EasyFit Professional

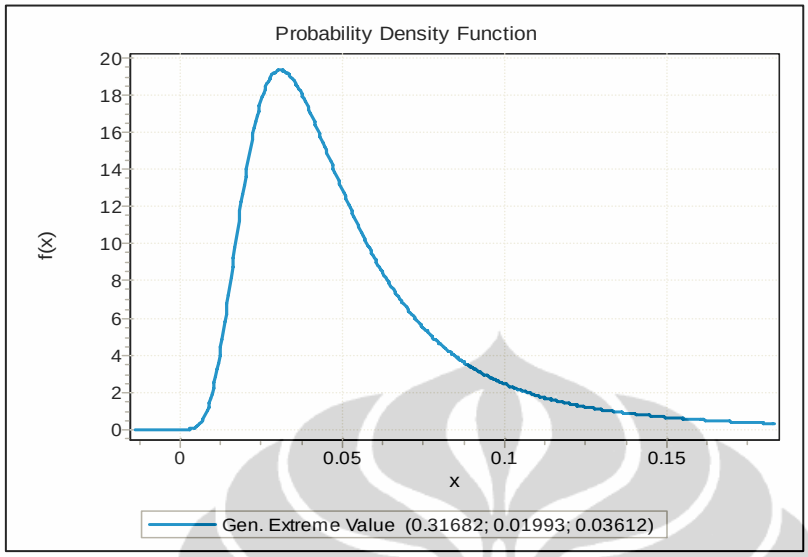
Shape	0.43268
Scale	0.01945
Location	0.04494
VaR	**0.32902**

Lampiran 38 : Hasil Estimasi Parameter Distribusi GEV Propane Future

No (a)	Minima Data (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.24784	0.99074	0.24554	0.98157	0.24327
2	0.18696	0.97222	0.18176	0.94522	0.17671
3	0.15783	0.95370	0.15052	0.90955	0.14355
4	0.13459	0.93519	0.12587	0.87457	0.11771
5	0.10683	0.91667	0.09793	0.84028	0.08977
6	0.09209	0.89815	0.08271	0.80667	0.07428
7	0.09038	0.87963	0.07950	0.77375	0.06993
8	0.08701	0.86111	0.07493	0.74151	0.06452
9	0.08370	0.84259	0.07052	0.70996	0.05942
10	0.07780	0.82407	0.06412	0.67910	0.05284
11	0.07674	0.80556	0.06182	0.64892	0.04980
12	0.07136	0.78704	0.05616	0.61943	0.04420
13	0.06947	0.76852	0.05339	0.59062	0.04103
14	0.06649	0.75000	0.04987	0.56250	0.03740
15	0.06492	0.73148	0.04749	0.53507	0.03474
16	0.06239	0.71296	0.04448	0.50832	0.03171
17	0.06163	0.69444	0.04280	0.48225	0.02972
18	0.06009	0.67593	0.04062	0.45688	0.02746
19	0.05919	0.65741	0.03891	0.43218	0.02558
20	0.05752	0.63889	0.03675	0.40818	0.02348
21	0.05311	0.62037	0.03295	0.38486	0.02044
22	0.05129	0.60185	0.03087	0.36223	0.01858
23	0.05086	0.58333	0.02967	0.34028	0.01731
24	0.04617	0.56481	0.02607	0.31902	0.01473
25	0.04585	0.54630	0.02505	0.29844	0.01368
26	0.04458	0.52778	0.02353	0.27855	0.01242
27	0.04389	0.50926	0.02235	0.25934	0.01138
28	0.04293	0.49074	0.02107	0.24083	0.01034
29	0.04252	0.47222	0.02008	0.22299	0.00948
30	0.04156	0.45370	0.01886	0.20585	0.00855
31	0.04112	0.43519	0.01789	0.18939	0.00779
32	0.03974	0.41667	0.01656	0.17361	0.00690
33	0.03922	0.39815	0.01562	0.15852	0.00622
34	0.03736	0.37963	0.01418	0.14412	0.00538
35	0.03591	0.36111	0.01297	0.13040	0.00468
36	0.03525	0.34259	0.01207	0.11737	0.00414
37	0.03390	0.32407	0.01099	0.10502	0.00356
38	0.03271	0.30556	0.00999	0.09336	0.00305
39	0.03189	0.28704	0.00915	0.08239	0.00263
40	0.03158	0.26852	0.00848	0.07210	0.00228
41	0.02878	0.25000	0.00719	0.06250	0.00180
42	0.02869	0.23148	0.00664	0.05358	0.00154
43	0.02857	0.21296	0.00609	0.04535	0.00130
44	0.02717	0.19444	0.00528	0.03781	0.00103
45	0.02632	0.17593	0.00463	0.03095	0.00081
46	0.02582	0.15741	0.00406	0.02478	0.00064
47	0.02560	0.13889	0.00355	0.01929	0.00049
48	0.02273	0.12037	0.00274	0.01449	0.00033
49	0.01917	0.10185	0.00195	0.01037	0.00020
50	0.01902	0.08333	0.00158	0.00694	0.00013
51	0.01869	0.06481	0.00121	0.00420	0.00008
52	0.01832	0.04630	0.00085	0.00214	0.00004
53	0.01626	0.02778	0.00045	0.00077	0.00001
54	0.01443	0.00926	0.00013	0.00009	0.00000
	0.05659		0.03834		0.03017
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.02009
m2	0.03391
c	0.03843
Shape	0.29766
Location	0.03665
Scale	0.02017
VaR	**0.2353**



Sumber : Data EIA, diolah dengan EasyFit Professional

Shape	0.31682
Scale	0.01993
Location	0.03612
VaR	**0.24334**

Lampiran 39 : Hasil Estimasi Parameter Distribusi GPD WTI Spot

Threshold *"Mean Excess Function"*

No (a)	Minima (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.406395774	0.999426	0.4062	0.998852	0.40593
2	0.172552751	0.998278	0.1723	0.996559	0.17196
3	0.170917856	0.997130	0.1704	0.994268	0.16994
4	0.151909029	0.995982	0.1513	0.991979	0.15069
5	0.140857433	0.994834	0.1401	0.989694	0.13941
850	0.017795023	0.024684	0.0004	0.000609	0.00001
851	0.017782406	0.023536	0.0004	0.000554	0.00001
852	0.017736511	0.022388	0.0004	0.000501	0.00001
853	0.017736511	0.021240	0.0004	0.000451	0.00001
854	0.017735453	0.020092	0.0004	0.000404	0.00001
855	0.017734455	0.018944	0.0003	0.000359	0.00001
856	0.017733207	0.017796	0.0003	0.000317	0.00001
857	0.017724022	0.016648	0.0003	0.000277	0.00000
858	0.017715658	0.015499	0.0003	0.000240	0.00000
859	0.017715255	0.014351	0.0003	0.000206	0.00000
860	0.017699577	0.013203	0.0002	0.000174	0.00000
861	0.017695892	0.012055	0.0002	0.000145	0.00000
862	0.017681693	0.010907	0.0002	0.000119	0.00000
863	0.017670617	0.009759	0.0002	0.000095	0.00000
864	0.017670255	0.008611	0.0002	0.000074	0.00000
865	0.017652709	0.007463	0.0001	0.000056	0.00000
866	0.017641031	0.006315	0.0001	0.000040	0.00000
867	0.01761298	0.005166	0.0001	0.000027	0.00000
868	0.017606926	0.004018	0.0001	0.000016	0.00000
869	0.017598798	0.002870	0.0001	0.000008	0.00000
870	0.017589693	0.001722	0.0000	0.000003	0.00000
871	0.017523536	0.000574	0.0000	0.000000	0.00000
	0.0344927		0.0218799		0.0167905
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.00927
m2	0.01588
shape	0.19676
scale	0.01342
location	0.01778
alpha	0.99000
N	2,438.000
Nu	871.000
VaR	**0.08743**

Threshold 100 Minima terbesar

No (a)	Minima Data (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.40640	0.995000	0.4044	0.990025	0.40234
2	0.17255	0.985000	0.1700	0.970225	0.16741
3	0.17092	0.975000	0.1666	0.950625	0.16248
4	0.15191	0.965000	0.1466	0.931225	0.14146
5	0.14086	0.955000	0.1345	0.912025	0.12847
80	0.05698	0.205000	0.0117	0.042025	0.00239
81	0.05654	0.195000	0.0110	0.038025	0.00215
82	0.05602	0.185000	0.0104	0.034225	0.00192
83	0.05591	0.175000	0.0098	0.030625	0.00171
84	0.05566	0.165000	0.0092	0.027225	0.00152
85	0.05552	0.155000	0.0086	0.024025	0.00133
86	0.05548	0.145000	0.0080	0.021025	0.00117
87	0.05491	0.135000	0.0074	0.018225	0.00100
88	0.05478	0.125000	0.0068	0.015625	0.00086
89	0.05429	0.115000	0.0062	0.013225	0.00072
90	0.05381	0.105000	0.0057	0.011025	0.00059
91	0.05318	0.095000	0.0051	0.009025	0.00048
92	0.05249	0.085000	0.0045	0.007225	0.00038
93	0.05226	0.075000	0.0039	0.005625	0.00029
94	0.05208	0.065000	0.0034	0.004225	0.00022
95	0.05203	0.055000	0.0029	0.003025	0.00016
96	0.05169	0.045000	0.0023	0.002025	0.00010
97	0.05168	0.035000	0.0018	0.001225	0.00006
98	0.05162	0.025000	0.0013	0.000625	0.00003
99	0.05141	0.015000	0.0008	0.000225	0.00001
100	0.05085	0.005000	0.0003	0.000025	0.00000
	0.0805566		0.0486475		0.0364773
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.01674
m2	0.02888
shape	0.24175
scale	0.02232
location	0.05113
alpha	0.99
N	2438
Nu	100
VaR	**0.08866**

Lampiran 40 : Hasil Estimasi Parameter Distribusi GPD Heating Oil Spot

Threshold *"Mean Excess Function"*

No (a)	Minima (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.47011695	0.999446	0.4699	0.998892	0.46960
2	0.404676775	0.998337	0.4040	0.996677	0.40333
3	0.368193713	0.997228	0.3672	0.994464	0.36616
4	0.155453761	0.996120	0.1549	0.992255	0.15425
5	0.154615299	0.995011	0.1538	0.990047	0.15308
880	0.018582256	0.024945	0.0005	0.000622	0.00001
881	0.018563538	0.023836	0.0004	0.000568	0.00001
882	0.018543086	0.022727	0.0004	0.000517	0.00001
883	0.018543086	0.021619	0.0004	0.000467	0.00001
884	0.018536804	0.020510	0.0004	0.000421	0.00001
885	0.018520853	0.019401	0.0004	0.000376	0.00001
886	0.018503472	0.018293	0.0003	0.000335	0.00001
887	0.018484815	0.017184	0.0003	0.000295	0.00001
888	0.018453679	0.016075	0.0003	0.000258	0.00000
889	0.018420968	0.014967	0.0003	0.000224	0.00000
890	0.018415584	0.013858	0.0003	0.000192	0.00000
891	0.018412959	0.012749	0.0002	0.000163	0.00000
892	0.018393893	0.011641	0.0002	0.000136	0.00000
893	0.018391323	0.010532	0.0002	0.000111	0.00000
894	0.018349139	0.009424	0.0002	0.000089	0.00000
895	0.018332649	0.008315	0.0002	0.000069	0.00000
896	0.018324684	0.007206	0.0001	0.000052	0.00000
897	0.01831608	0.006098	0.0001	0.000037	0.00000
898	0.018296268	0.004989	0.0001	0.000025	0.00000
899	0.018259789	0.003880	0.0001	0.000015	0.00000
900	0.018249722	0.002772	0.0001	0.000008	0.00000
901	0.018244982	0.001663	0.0000	0.000003	0.00000
902	0.018228722	0.000554	0.0000	0.000000	0.00000
	0.0349820		0.0222333		0.0171347
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.00948
m2	0.01642
shape	0.26568
scale	0.01208
location	0.01853
alpha	0.99000
N	2,450.000
Nu	902.000
VaR	**0.09157**

Threshold 100 Minima terbesar

No (a)	Minima (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.47012	0.99500	0.46777	0.99003	0.46543
2	0.40468	0.98500	0.39861	0.97023	0.39263
3	0.36819	0.97500	0.35899	0.95063	0.35001
4	0.15545	0.96500	0.15001	0.93123	0.14476
5	0.15462	0.95500	0.14766	0.91203	0.14101
80	0.05662	0.20500	0.01161	0.04203	0.00238
81	0.05642	0.19500	0.01100	0.03803	0.00215
82	0.05635	0.18500	0.01043	0.03423	0.00193
83	0.05618	0.17500	0.00983	0.03063	0.00172
84	0.05595	0.16500	0.00923	0.02723	0.00152
85	0.05557	0.15500	0.00861	0.02403	0.00134
86	0.05521	0.14500	0.00801	0.02103	0.00116
87	0.05518	0.13500	0.00745	0.01823	0.00101
88	0.05511	0.12500	0.00689	0.01563	0.00086
89	0.05498	0.11500	0.00632	0.01323	0.00073
90	0.05488	0.10500	0.00576	0.01103	0.00061
91	0.05453	0.09500	0.00518	0.00903	0.00049
92	0.05407	0.08500	0.00460	0.00723	0.00039
93	0.05406	0.07500	0.00405	0.00563	0.00030
94	0.05363	0.06500	0.00349	0.00423	0.00023
95	0.05328	0.05500	0.00293	0.00303	0.00016
96	0.05316	0.04500	0.00239	0.00203	0.00011
97	0.05283	0.03500	0.00185	0.00123	0.00006
98	0.05277	0.02500	0.00132	0.00063	0.00003
99	0.05267	0.01500	0.00079	0.00023	0.00001
100	0.05257	0.00500	0.00026	0.00003	0.00000
	0.08407		0.05220		0.04016
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.02033
m2	0.03642
shape	0.47245
scale	0.01638
location	0.05301
alpha	0.99000
N	2,450.000
Nu	100.000
VaR	**0.08573**

Lampiran 41 : Hasil Estimasi Parameter Distribusi GPD Propane Spot

Threshold "Mean Excess Function"

No (a)	Minima (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.498612922	0.998899	0.4981	0.997799	0.49752
2	0.39756164	0.996696	0.3962	0.993403	0.39494
3	0.219362828	0.994493	0.2182	0.989017	0.21695
4	0.143155595	0.992291	0.1421	0.984641	0.14096
5	0.127833372	0.990088	0.1266	0.980274	0.12531
430	0.018265348	0.053965	0.0010	0.002912	0.00005
431	0.018227034	0.051762	0.0009	0.002679	0.00005
432	0.018207222	0.049559	0.0009	0.002456	0.00004
433	0.018195629	0.047357	0.0009	0.002243	0.00004
434	0.018134173	0.045154	0.0008	0.002039	0.00004
435	0.018131464	0.042952	0.0008	0.001845	0.00003
436	0.018018506	0.040749	0.0007	0.001660	0.00003
437	0.018018506	0.038546	0.0007	0.001486	0.00003
438	0.017992219	0.036344	0.0007	0.001321	0.00002
439	0.017992219	0.034141	0.0006	0.001166	0.00002
440	0.017953804	0.031938	0.0006	0.001020	0.00002
441	0.017937701	0.029736	0.0005	0.000884	0.00002
442	0.017764765	0.027533	0.0005	0.000758	0.00001
443	0.017749845	0.025330	0.0004	0.000642	0.00001
444	0.017745171	0.023128	0.0004	0.000535	0.00001
445	0.017714508	0.020925	0.0004	0.000438	0.00001
446	0.017714508	0.018722	0.0003	0.000351	0.00001
447	0.017654935	0.016520	0.0003	0.000273	0.00000
448	0.017637141	0.014317	0.0003	0.000205	0.00000
449	0.017618497	0.012115	0.0002	0.000147	0.00000
450	0.017595762	0.009912	0.0002	0.000098	0.00000
451	0.017562985	0.007709	0.0001	0.000059	0.00000
452	0.017537621	0.005507	0.0001	0.000030	0.00000
453	0.017520042	0.003304	0.0001	0.000011	0.00000
454	0.017493157	0.001101	0.0000	0.000001	0.00000
	0.0361860		0.0236817		0.0185912
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.01118
m2	0.01959
shape	0.34201
scale	0.01219
location	0.01765
alpha	0.99000
N	1,367.000
Nu	454.000
VaR	**0.10014**

Threshold 100 Minima terbesar

No (a)	Minima (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.49861	0.99500	0.49612	0.99003	0.49364
2	0.39756	0.98500	0.39160	0.97023	0.38572
3	0.21936	0.97500	0.21388	0.95063	0.20853
4	0.14316	0.96500	0.13815	0.93123	0.13331
5	0.12783	0.95500	0.12208	0.91203	0.11659
80	0.04537	0.20500	0.00930	0.04203	0.00191
81	0.04534	0.19500	0.00884	0.03803	0.00172
82	0.04517	0.18500	0.00836	0.03423	0.00155
83	0.04498	0.17500	0.00787	0.03063	0.00138
84	0.04465	0.16500	0.00737	0.02723	0.00122
85	0.04461	0.15500	0.00691	0.02403	0.00107
86	0.04445	0.14500	0.00645	0.02103	0.00093
87	0.04420	0.13500	0.00597	0.01823	0.00081
88	0.04349	0.12500	0.00544	0.01563	0.00068
89	0.04321	0.11500	0.00497	0.01323	0.00057
90	0.04318	0.10500	0.00453	0.01103	0.00048
91	0.04295	0.09500	0.00408	0.00903	0.00039
92	0.04286	0.08500	0.00364	0.00723	0.00031
93	0.04279	0.07500	0.00321	0.00563	0.00024
94	0.04271	0.06500	0.00278	0.00423	0.00018
95	0.04268	0.05500	0.00235	0.00303	0.00013
96	0.04241	0.04500	0.00191	0.00203	0.00009
97	0.04223	0.03500	0.00148	0.00123	0.00005
98	0.04222	0.02500	0.00106	0.00063	0.00003
99	0.04208	0.01500	0.00063	0.00023	0.00001
100	0.04162	0.00500	0.00021	0.00003	0.00000
	0.07232		0.04598		0.03575
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.01965
m2	0.03492
shape	0.42660
scale	0.01773
location	0.04140
alpha	0.99000
N	1,367.00000
Nu	100.00000
VaR	**0.09697**

Lampiran 42 : Hasil Estimasi Parameter Distribusi GPD WTI Future

Threshold "Mean Excess Function"

No (a)	Minima (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.400477567	0.999446	0.4003	0.998893	0.40003
2	0.174480229	0.998339	0.1742	0.996681	0.17390
3	0.16544513	0.997231	0.1650	0.994471	0.16453
4	0.145131301	0.996124	0.1446	0.992263	0.14401
5	0.138581791	0.995017	0.1379	0.990058	0.13720
880	0.017102787	0.026024	0.0004	0.000677	0.00001
881	0.017099949	0.024917	0.0004	0.000621	0.00001
882	0.017094433	0.023810	0.0004	0.000567	0.00001
883	0.017086539	0.022702	0.0004	0.000515	0.00001
884	0.017083201	0.021595	0.0004	0.000466	0.00001
885	0.017070116	0.020487	0.0003	0.000420	0.00001
886	0.01705681	0.019380	0.0003	0.000376	0.00001
887	0.017039816	0.018272	0.0003	0.000334	0.00001
888	0.01703005	0.017165	0.0003	0.000295	0.00001
889	0.016993763	0.016058	0.0003	0.000258	0.00000
890	0.016986577	0.014950	0.0003	0.000224	0.00000
891	0.01696188	0.013843	0.0002	0.000192	0.00000
892	0.016933613	0.012735	0.0002	0.000162	0.00000
893	0.01689998	0.011628	0.0002	0.000135	0.00000
894	0.016892294	0.010520	0.0002	0.000111	0.00000
895	0.016873291	0.009413	0.0002	0.000089	0.00000
896	0.016872561	0.008306	0.0001	0.000069	0.00000
897	0.016857117	0.007198	0.0001	0.000052	0.00000
898	0.016815193	0.006091	0.0001	0.000037	0.00000
899	0.016789202	0.004983	0.0001	0.000025	0.00000
900	0.016787659	0.003876	0.0001	0.000015	0.00000
901	0.016782471	0.002769	0.0000	0.000008	0.00000
902	0.01677547	0.001661	0.0000	0.000003	0.00000
903	0.0167752	0.000554	0.0000	0.000000	0.00000
	0.0326478		0.0206447		0.0158011
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.00864
m2	0.01476
shape	0.17307
scale	0.01306
location	0.01686
alpha	0.99000
N	2,466.000
Nu	903.000
VaR	**0.08209**

Threshold 100 Minima terbesar

No (a)	Minima (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.400477567	0.995000	0.3985	0.990025	0.39648
2	0.174480229	0.985000	0.1719	0.970225	0.16929
3	0.16544513	0.975000	0.1613	0.950625	0.15728
4	0.145131301	0.965000	0.1401	0.931225	0.13515
5	0.138581791	0.955000	0.1323	0.912025	0.12639
80	0.053286745	0.205000	0.0109	0.042025	0.00224
81	0.052190913	0.195000	0.0102	0.038025	0.00198
82	0.052169544	0.185000	0.0097	0.034225	0.00179
83	0.052112951	0.175000	0.0091	0.030625	0.00160
84	0.05166488	0.165000	0.0085	0.027225	0.00141
85	0.051458297	0.155000	0.0080	0.024025	0.00124
86	0.051326417	0.145000	0.0074	0.021025	0.00108
87	0.051155163	0.135000	0.0069	0.018225	0.00093
88	0.051013378	0.125000	0.0064	0.015625	0.00080
89	0.051010769	0.115000	0.0059	0.013225	0.00067
90	0.050495288	0.105000	0.0053	0.011025	0.00056
91	0.050477359	0.095000	0.0048	0.009025	0.00046
92	0.050368353	0.085000	0.0043	0.007225	0.00036
93	0.049970953	0.075000	0.0037	0.005625	0.00028
94	0.049810052	0.065000	0.0032	0.004225	0.00021
95	0.049502492	0.055000	0.0027	0.003025	0.00015
96	0.049379593	0.045000	0.0022	0.002025	0.00010
97	0.049305761	0.035000	0.0017	0.001225	0.00006
98	0.049305761	0.025000	0.0012	0.000625	0.00003
99	0.049065194	0.015000	0.0007	0.000225	0.00001
100	0.048965456	0.005000	0.0002	0.000025	0.00000
	0.0754339		0.0457196		0.0344317
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.01601
m2	0.02786
shape	0.30000
scale	0.01905
location	0.04822
alpha	0.99000
N	2,466.000
Nu	100.000
VaR	**0.08136**

Lampiran 43 : Hasil Estimasi Parameter Distribusi GPD Heating Oil Future

Threshold "Mean Excess Function"

No (a)	Minima (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.390942256	0.999446	0.3907	0.998893	0.39051
2	0.274839917	0.998339	0.2744	0.996681	0.27393
3	0.209710027	0.997231	0.2091	0.994471	0.20855
4	0.192485303	0.996124	0.1917	0.992263	0.19100
5	0.180426169	0.995017	0.1795	0.990058	0.17863
880	0.017183675	0.026024	0.0004	0.000677	0.00001
881	0.017173506	0.024917	0.0004	0.000621	0.00001
882	0.017152549	0.023810	0.0004	0.000567	0.00001
883	0.017142739	0.022702	0.0004	0.000515	0.00001
884	0.017140852	0.021595	0.0004	0.000466	0.00001
885	0.017134992	0.020487	0.0004	0.000420	0.00001
886	0.017117101	0.019380	0.0003	0.000376	0.00001
887	0.017087576	0.018272	0.0003	0.000334	0.00001
888	0.01708521	0.017165	0.0003	0.000295	0.00001
889	0.017067003	0.016058	0.0003	0.000258	0.00000
890	0.017063728	0.014950	0.0003	0.000224	0.00000
891	0.017057137	0.013843	0.0002	0.000192	0.00000
892	0.017027261	0.012735	0.0002	0.000162	0.00000
893	0.017012319	0.011628	0.0002	0.000135	0.00000
894	0.017007588	0.010520	0.0002	0.000111	0.00000
895	0.017001779	0.009413	0.0002	0.000089	0.00000
896	0.016997576	0.008306	0.0001	0.000069	0.00000
897	0.016994075	0.007198	0.0001	0.000052	0.00000
898	0.016952551	0.006091	0.0001	0.000037	0.00000
899	0.016925284	0.004983	0.0001	0.000025	0.00000
900	0.016910147	0.003876	0.0001	0.000015	0.00000
901	0.016904986	0.002769	0.0000	0.000008	0.00000
902	0.016890472	0.001661	0.0000	0.000003	0.00000
903	0.016874903	0.000554	0.0000	0.000000	0.00000
	0.0331513		0.0212074		0.0164000
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.00926
m2	0.01605
shape	0.26953
scale	0.01171
location	0.01712
alpha	0.99000
N	2,492.000
Nu	903.000
VaR	**0.08801**

Threshold 100 Minima terbesar

No (a)	Minima (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.390942256	0.995000	0.3890	0.990025	0.38704
2	0.274839917	0.985000	0.2707	0.970225	0.26666
3	0.209710027	0.975000	0.2045	0.950625	0.19936
4	0.192485303	0.965000	0.1857	0.931225	0.17925
5	0.180426169	0.955000	0.1723	0.912025	0.16455
80	0.053525937	0.205000	0.0110	0.042025	0.00225
81	0.053352674	0.195000	0.0104	0.038025	0.00203
82	0.05297849	0.185000	0.0098	0.034225	0.00181
83	0.052796764	0.175000	0.0092	0.030625	0.00162
84	0.052660438	0.165000	0.0087	0.027225	0.00143
85	0.052471982	0.155000	0.0081	0.024025	0.00126
86	0.052086164	0.145000	0.0076	0.021025	0.00110
87	0.051850224	0.135000	0.0070	0.018225	0.00094
88	0.051674504	0.125000	0.0065	0.015625	0.00081
89	0.050966763	0.115000	0.0059	0.013225	0.00067
90	0.050777561	0.105000	0.0053	0.011025	0.00056
91	0.050694994	0.095000	0.0048	0.009025	0.00046
92	0.050625995	0.085000	0.0043	0.007225	0.00037
93	0.05043636	0.075000	0.0038	0.005625	0.00028
94	0.050335525	0.065000	0.0033	0.004225	0.00021
95	0.050335422	0.055000	0.0028	0.003025	0.00015
96	0.050291946	0.045000	0.0023	0.002025	0.00010
97	0.05021112	0.035000	0.0018	0.001225	0.00006
98	0.050085066	0.025000	0.0013	0.000625	0.00003
99	0.050069191	0.015000	0.0008	0.000225	0.00001
100	0.049594346	0.005000	0.0002	0.000025	0.00000
	0.0813576		0.0507050		0.0388748
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

GPD

m1	0.02005
m2	0.03527
shape	0.36407
scale	0.02086
location	0.04855
alpha	0.99000
N	2,492.000
Nu	100.000
VaR	**0.08628**

Lampiran 44 : Hasil Estimasi Parameter Distribusi GPD Propane Future

Threshold "Mean Excess Function"

No (a)	Minima (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.247836164	0.998881	0.2476	0.997764	0.24728
2	0.186956559	0.996644	0.1863	0.993300	0.18570
3	0.157825239	0.994407	0.1569	0.988846	0.15606
4	0.134590154	0.992170	0.1335	0.984401	0.13249
5	0.124454174	0.989933	0.1232	0.979967	0.12196
420	0.016269644	0.061521	0.0010	0.003785	0.00006
421	0.016260521	0.059284	0.0010	0.003515	0.00006
422	0.016260521	0.057047	0.0009	0.003254	0.00005
423	0.016238516	0.054810	0.0009	0.003004	0.00005
424	0.016201379	0.052573	0.0009	0.002764	0.00004
425	0.016129382	0.050336	0.0008	0.002534	0.00004
426	0.01607047	0.048098	0.0008	0.002313	0.00004
427	0.016000341	0.045861	0.0007	0.002103	0.00003
428	0.016000341	0.043624	0.0007	0.001903	0.00003
429	0.016000341	0.041387	0.0007	0.001713	0.00003
430	0.015979035	0.039150	0.0006	0.001533	0.00002
431	0.015949301	0.036913	0.0006	0.001363	0.00002
432	0.015921953	0.034676	0.0006	0.001202	0.00002
433	0.015915455	0.032438	0.0005	0.001052	0.00002
434	0.015906173	0.030201	0.0005	0.000912	0.00001
435	0.01588736	0.027964	0.0004	0.000782	0.00001
436	0.015873349	0.025727	0.0004	0.000662	0.00001
437	0.015873349	0.023490	0.0004	0.000552	0.00001
438	0.015810606	0.021253	0.0003	0.000452	0.00001
439	0.015773198	0.019016	0.0003	0.000362	0.00001
440	0.015748357	0.016779	0.0003	0.000282	0.00000
441	0.015707129	0.014541	0.0002	0.000211	0.00000
442	0.015666117	0.012304	0.0002	0.000151	0.00000
443	0.015634714	0.010067	0.0002	0.000101	0.00000
444	0.015607898	0.007830	0.0001	0.000061	0.00000
445	0.015552413	0.005593	0.0001	0.000031	0.00000
446	0.015504187	0.003356	0.0001	0.000011	0.00000
447	0.01542447	0.001119	0.0000	0.000001	0.00000
	0.0319001		0.0204966		0.0158371
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

m1	0.00909
m2	0.01561
shape	0.20985
scale	0.01286
location	0.01562
alpha	0.99000
N	1,368.000
Nu	447.000
VaR	**0.08173**

Threshold 100 Minima terbesar

No (a)	Minima (b)	Plot Position (c)	w1 (d)	(Plot Pos)^2 (e)	w2 (f)
1	0.247836164	0.99500	0.24660	0.99003	0.24536
2	0.186956559	0.98500	0.18415	0.97023	0.18139
3	0.157825239	0.97500	0.15388	0.95063	0.15003
4	0.134590154	0.96500	0.12988	0.93123	0.12533
5	0.124454174	0.95500	0.11885	0.91203	0.11351
80	0.041510499	0.20500	0.00851	0.04203	0.00174
81	0.04143719	0.19500	0.00808	0.03803	0.00158
82	0.041385216	0.18500	0.00766	0.03423	0.00142
83	0.041118247	0.17500	0.00720	0.03063	0.00126
84	0.040821995	0.16500	0.00674	0.02723	0.00111
85	0.040821995	0.15500	0.00633	0.02403	0.00098
86	0.040578359	0.14500	0.00588	0.02103	0.00085
87	0.040454955	0.13500	0.00546	0.01823	0.00074
88	0.040351296	0.12500	0.00504	0.01563	0.00063
89	0.040273899	0.11500	0.00463	0.01323	0.00053
90	0.040119994	0.10500	0.00421	0.01103	0.00044
91	0.040094457	0.09500	0.00381	0.00903	0.00036
92	0.039905544	0.08500	0.00339	0.00723	0.00029
93	0.039740329	0.07500	0.00298	0.00563	0.00022
94	0.039478811	0.06500	0.00257	0.00423	0.00017
95	0.039220713	0.05500	0.00216	0.00303	0.00012
96	0.039220713	0.04500	0.00176	0.00203	0.00008
97	0.039220713	0.03500	0.00137	0.00123	0.00005
98	0.038490164	0.02500	0.00096	0.00063	0.00002
99	0.038151766	0.01500	0.00057	0.00023	0.00001
100	0.037979248	0.00500	0.00019	0.00003	0.00000
	0.06027		0.03669		0.02768
	ω_0		ω_1		ω_2

Sumber : Data EIA, diolah dengan Microsoft Excel

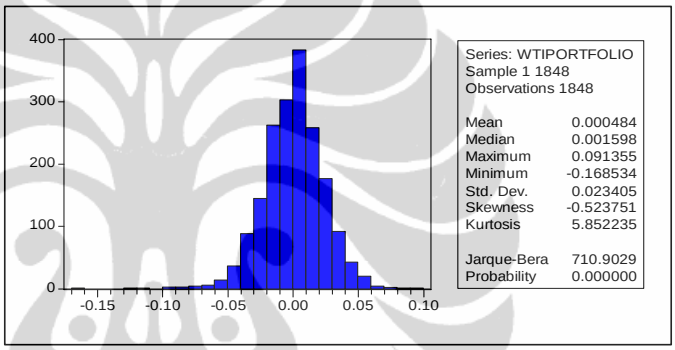
m1	0.01312
m2	0.02278
shape	0.28416
scale	0.01611
location	0.03776
alpha	0.99000
N	1,368.00000
Nu	100.00000
VaR	**0.08085**

Lampiran 45 : Perhitungan VaR Portfolio WTI

wa	0.56
wb	0.44
stdev a	0.018756
stdev b	0.021377
correl ab	-0.879745
N*	**-0.771876**
Exposure a	64,020
Exposure b	49,408
Total portfolio	113,428
Alpha portfolio	2.711
Varians portfolio	0.000025
Stdev portfolio	0.005033
VaR portfolio	**1,548**

Data Return Tertimbang Portfolio

Tanggal	$R_p = w_1 R_1 + w_2 R_2$
Jan 04, 2000	(0.00525)
Jan 05, 2000	(0.03151)
Jan 06, 2000	0.00092
Jan 07, 2000	(0.00996)
Jan 10, 2000	0.00619
Apr 02, 2007	0.00123
Apr 03, 2007	(0.02112)
Apr 04, 2007	(0.00342)
Apr 05, 2007	(0.00191)
Apr 09, 2007	(0.04387)
Apr 10, 2007	0.00643
Apr 11, 2007	0.00139
Apr 12, 2007	0.02969
Apr 13, 2007	(0.00363)
Apr 16, 2007	(0.00014)
Apr 17, 2007	(0.00787)
Apr 18, 2007	0.00021
Apr 19, 2007	(0.02108)
Apr 20, 2007	0.02654
Apr 23, 2007	0.03242
Apr 24, 2007	(0.01948)
Apr 25, 2007	0.01914
Apr 26, 2007	(0.00736)
Apr 27, 2007	0.02103
Apr 30, 2007	(0.01066)
May 01, 2007	(0.02048)
May 02, 2007	(0.01062)
May 03, 2007	(0.00825)
May 04, 2007	(0.02086)
May 07, 2007	(0.00700)
May 08, 2007	0.01268
May 09, 2007	(0.01156)
May 10, 2007	0.00467
May 11, 2007	0.00847
May 14, 2007	0.00244
May 15, 2007	0.01040
May 16, 2007	(0.00959)
May 17, 2007	0.03582
May 18, 2007	0.00141
May 21, 2007	0.02019
May 22, 2007	(0.02016)
May 23, 2007	0.00698
May 24, 2007	(0.02364)
May 25, 2007	0.01541
May 29, 2007	(0.02628)
May 30, 2007	0.00483
May 31, 2007	0.00842



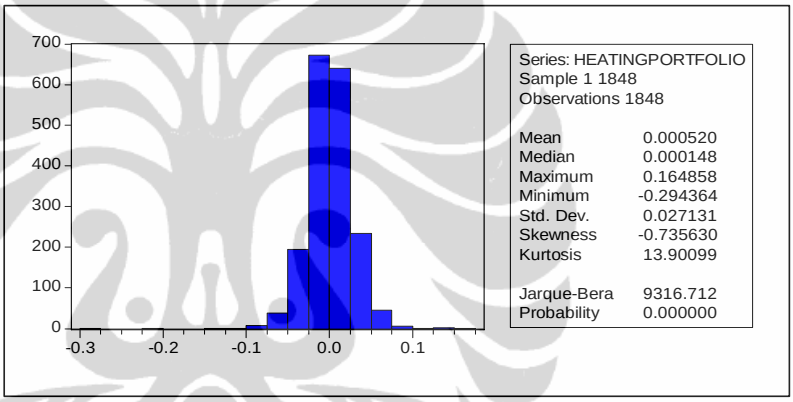
Sumber : Data EIA, diolah dengan Eviews

Lampiran 46 : Perhitungan VaR Portfolio Heating Oil

wa	0.59
wb	0.41
stdev a	0.021567
stdev b	0.021359
correl ab	-0.683292
N*	**-0.689920**
Exposure a	79,443
Exposure b	54,554
Total portfolio	133,997
Alpha portfolio	2.867
Varians portfolio	0.000087
Stdev portfolio	0.009336
VaR portfolio	**3,587**

Data Return Tertimbang Portfolio

Tanggal	$R_p = w_1R_1 + w_2R_2$
Jan 04, 2000	(0.01720)
Jan 05, 2000	(0.02170)
Jan 06, 2000	0.00257
Jan 07, 2000	(0.02310)
Jan 10, 2000	0.00008
Apr 02, 2007	(0.00740)
Apr 03, 2007	(0.01326)
Apr 04, 2007	0.01565
Apr 05, 2007	(0.00283)
Apr 09, 2007	(0.02174)
Apr 10, 2007	0.02174
Apr 11, 2007	0.00749
Apr 12, 2007	0.01932
Apr 13, 2007	(0.00617)
Apr 16, 2007	(0.01909)
Apr 17, 2007	(0.03145)
Apr 18, 2007	0.00340
Apr 19, 2007	(0.00106)
Apr 20, 2007	0.01417
Apr 23, 2007	0.03235
Apr 24, 2007	(0.02463)
Apr 25, 2007	0.02864
Apr 26, 2007	(0.00529)
Apr 27, 2007	0.01095
Apr 30, 2007	(0.00513)
May 01, 2007	(0.00876)
May 02, 2007	(0.01881)
May 03, 2007	(0.00026)
May 04, 2007	(0.01000)
May 07, 2007	(0.01490)
May 08, 2007	0.01419
May 09, 2007	(0.00623)
May 10, 2007	0.02473
May 11, 2007	0.00993
May 14, 2007	(0.00791)
May 15, 2007	0.01059
May 16, 2007	(0.01124)
May 17, 2007	0.03433
May 18, 2007	(0.00954)
May 21, 2007	0.01774
May 22, 2007	(0.02074)
May 23, 2007	0.01196
May 24, 2007	(0.00153)
May 25, 2007	0.00566
May 29, 2007	(0.03332)
May 30, 2007	(0.00174)
May 31, 2007	0.00755



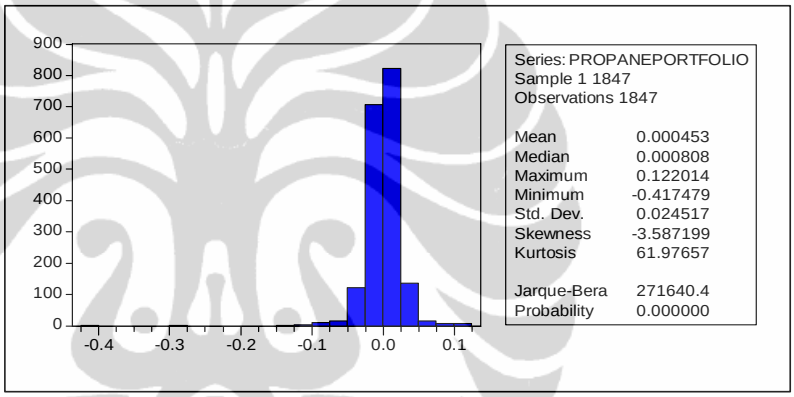
Sumber : Data EIA, diolah dengan Eviews

Lampiran 47 : Perhitungan VaR Portfolio Propane

wa	0.68
wb	0.32
stdev a	0.015434
stdev b	0.021982
correl ab	-0.680097
N*	**-0.477503**
Exposure a	47,594
Exposure b	22,763
Total portfolio	70,357
Alpha portfolio	4.964
Varians portfolio	0.000059
Stdev portfolio	0.007654
VaR portfolio	**2,673**

Data Return Tertimbang Portfolio

Tanggal	$R_p = w_1R_1 + w_2R_2$
Jan 04, 2000	(0.07448)
Jan 05, 2000	0.00558
Jan 06, 2000	0.06708
Jan 07, 2000	0.01094
Jan 10, 2000	(0.00185)
Apr 02, 2007	(0.01149)
Apr 03, 2007	(0.01784)
Apr 04, 2007	(0.00307)
Apr 05, 2007	0.00427
Apr 09, 2007	(0.00325)
Apr 10, 2007	0.00477
Apr 11, 2007	0.00821
Apr 12, 2007	0.02533
Apr 13, 2007	0.00784
Apr 16, 2007	(0.00488)
Apr 17, 2007	(0.00153)
Apr 18, 2007	(0.00068)
Apr 19, 2007	0.00530
Apr 20, 2007	0.00894
Apr 23, 2007	0.01414
Apr 24, 2007	0.00215
Apr 25, 2007	0.01386
Apr 26, 2007	(0.00338)
Apr 27, 2007	0.00510
Apr 30, 2007	0.00607
May 01, 2007	(0.00572)
May 02, 2007	(0.01088)
May 03, 2007	(0.00522)
May 04, 2007	(0.00692)
May 07, 2007	(0.00962)
May 08, 2007	0.00488
May 09, 2007	(0.00036)
May 10, 2007	0.01647
May 11, 2007	0.00183
May 14, 2007	0.01157
May 15, 2007	(0.00105)
May 16, 2007	(0.00940)
May 17, 2007	0.01776
May 18, 2007	0.00094
May 21, 2007	0.00428
May 22, 2007	(0.00968)
May 23, 2007	(0.00174)
May 24, 2007	(0.00211)
May 25, 2007	0.01290
May 29, 2007	(0.01665)
May 30, 2007	(0.00211)
May 31, 2007	(0.01350)



Sumber : Data EIA, diolah dengan Eviews