

LAMPIRAN 1
DATA AKTUAL PENJUALAN DAN
RAMALAN PENJUALAN BERDASARKAN
METODE JUDGMENTAL FORECASTING
SERTA
PENGUKURAN KESALAHAN PERAMALANNYA



Data Penjualan Aktual dan Ramalan Penjualan berdasarkan Metode Judgmental Forecasting; Produk Jamu Galian Singset

waktu			Data Aktual	Dala Ramalan	error
(1)	(2)	(3)	(4)	(5)	(6)
1	1996	Jan	6.344	7.000	(656)
2	1996	Feb	6.511	6.800	(289)
3	1996	Mar	6.539	6.800	(261)
4	1996	Apr	6.644	6.900	(256)
5	1996	May	6.779	7.000	(221)
6	1996	Jun	6.412	6.900	(488)
7	1996	Jul	5.799	6.500	(701)
8	1996	Aug	6.262	6.000	262
9	1996	Sep	6.209	6.000	209
10	1996	Oct	5.510	5.700	(190)
11	1996	Nov	5.376	5.500	(124)
12	1996	Dec	5.750	5.600	150
13	1997	Jan	6.426	6.000	426
14	1997	Feb	6.124	7.000	(876)
15	1997	Mar	6.220	6.700	(480)
16	1997	Apr	7.221	6.500	721
17	1997	May	6.786	7.300	(514)
18	1997	Jun	6.973	7.500	(527)
19	1997	Jul	7.401	7.600	(199)
20	1997	Aug	7.300	7.800	(500)
21	1997	Sep	7.464	7.400	64
22	1997	Oct	6.041	7.200	(1.159)
23	1997	Nov	5.871	6.600	(729)
24	1997	Dec	5.739	5.900	(161)
25	1998	Jan	5.889	5.800	89
26	1998	Feb	5.243	5.500	(257)
27	1998	Mar	3.236	5.000	(1.764)
28	1998	Apr	3.293	4.000	(707)
29	1998	May	3.596	3.500	96
30	1998	Jun	3.770	3.900	(130)
31	1998	Jul	3.786	4.000	(214)
32	1998	Aug	3.878	4.000	(122)
33	1998	Sep	4.369	4.300	69
34	1998	Oct	4.216	4.500	(284)
35	1998	Nov	4.424	4.500	(76)
36	1998	Dec	4.639	4.500	139
37	1999	Jan	4.186	4.500	(314)
38	1999	Feb	3.800	4.200	(400)
39	1999	Mar	3.735	4.000	(265)
40	1999	Apr	3.389	3.500	(111)
41	1999	May	3.562	3.200	362
42	1999	Jun	3.665	3.500	165
43	1999	Jul	4.217	3.700	517
44	1999	Aug	3.904	4.000	(96)

Sumber : Data sekunder perusahaan yang diolah peneliti

Pengukuran Kesalahan Peramalan Metode Judgmental Forecasting; Produk Jamu Galian Singset

waktu	error	AD	SE	APE	PE
(1)	(2)	(3)	(4)	(5)	(6)
1	(656)	656	430.336	10,34%	-10,34%
2	(289)	289	83.521	4,44%	-4,44%
3	(261)	261	68.121	3,99%	-3,99%
4	(256)	256	65.536	3,85%	-3,85%
5	(221)	221	48.841	3,26%	-3,26%
6	(488)	488	238.144	7,61%	-7,61%
7	(701)	701	491.401	12,09%	-12,09%
8	262	262	68.644	4,18%	4,18%
9	209	209	43.681	3,37%	3,37%
10	(190)	190	36.100	3,45%	-3,45%
11	(124)	124	15.376	2,31%	-2,31%
12	150	150	22.500	2,61%	2,61%
13	426	426	181.476	6,63%	6,63%
14	(876)	876	767.376	14,30%	-14,30%
15	(480)	480	230.400	7,72%	-7,72%
16	721	721	519.841	9,98%	9,98%
17	(514)	514	264.196	7,57%	-7,57%
18	(527)	527	277.729	7,56%	-7,56%
19	(199)	199	39.601	2,69%	-2,69%
20	(500)	500	250.000	6,85%	-6,85%
21	64	64	4.096	0,86%	0,86%
22	(1.159)	1.159	1.343.281	19,19%	-19,19%
23	(729)	729	531.441	12,42%	-12,42%
24	(161)	161	25.921	2,81%	-2,81%
25	89	89	7.921	1,51%	1,51%
26	(257)	257	66.049	4,90%	-4,90%
27	(1.764)	1.764	3.111.696	54,51%	-54,51%
28	(707)	707	499.849	21,47%	-21,47%
29	96	96	9.216	2,67%	2,67%
30	(130)	130	16.900	3,45%	-3,45%
31	(214)	214	45.796	5,65%	-5,65%
32	(122)	122	14.884	3,15%	-3,15%
33	69	69	4.761	1,58%	1,58%
34	(284)	284	80.656	6,74%	-6,74%
35	(76)	76	5.776	1,72%	-1,72%
36	139	139	19.321	3,00%	3,00%
37	(314)	314	98.596	7,50%	-7,50%
38	(400)	400	160.000	10,53%	-10,53%
39	(265)	265	70.225	7,10%	-7,10%
40	(111)	111	12.321	3,28%	-3,28%
41	362	362	131.044	10,16%	10,16%
42	165	165	27.225	4,50%	4,50%
43	517	517	267.289	12,26%	12,26%
44	(96)	96	9.216	2,46%	-2,46%

Metode Judgmental Forecasting			
MAD	MSE	MAPE	MPE
371,36	243.325,00	7,46%	-4,58%
Batas toleransi kesalahan peramalan =		966,83	

Sumber : Data sekunder perusahaan yang diolah peneliti

Data Penjualan Aktual dan Ramalan Penjualan berdasarkan Metode Judgmental Forecasting; Produk Jamu Pegelinu

waktu			Data Aktual	Data Ramalan	error
(1)	(2)	(3)	(4)	(5)	(6)
1	1996	Jan	10.050	11.000	(950)
2	1996	Feb	9.614	12.000	(2.386)
3	1996	Mar	11.184	12.500	(1.316)
4	1996	Apr	12.610	13.000	(390)
5	1996	May	14.523	14.000	523
6	1996	Jun	14.429	15.000	(571)
7	1996	Jul	15.722	15.000	722
8	1996	Aug	16.187	16.500	(313)
9	1996	Sep	16.598	17.000	(402)
10	1996	Oct	18.363	18.000	363
11	1996	Nov	19.259	19.000	259
12	1996	Dec	16.530	20.000	(3.470)
13	1997	Jan	13.186	17.000	(3.814)
14	1997	Feb	15.694	15.000	694
15	1997	Mar	18.070	20.000	(1.930)
16	1997	Apr	17.922	17.000	922
17	1997	May	21.258	19.000	2.258
18	1997	Jun	21.449	20.000	1.449
19	1997	Jul	20.624	22.000	(1.376)
20	1997	Aug	21.708	23.000	(1.292)
21	1997	Sep	20.374	22.000	(1.626)
22	1997	Oct	18.910	20.000	(1.090)
23	1997	Nov	15.937	18.000	(2.063)
24	1997	Dec	23.281	20.000	3.281
25	1998	Jan	18.887	25.000	(6.113)
26	1998	Feb	19.427	21.000	(1.573)
27	1998	Mar	22.650	19.000	3.650
28	1998	Apr	25.020	23.000	2.020
29	1998	May	26.564	25.000	1.564
30	1998	Jun	27.254	28.000	(746)
31	1998	Jul	28.109	29.000	(891)
32	1998	Aug	28.447	30.000	(1.553)
33	1998	Sep	27.922	32.000	(4.078)
34	1998	Oct	27.770	29.000	(1.230)
35	1998	Nov	29.505	30.000	(495)
36	1998	Dec	30.621	32.000	(1.379)
37	1999	Jan	20.675	25.000	(4.325)
38	1999	Feb	25.423	25.000	423
39	1999	Mar	26.437	27.000	(563)
40	1999	Apr	29.764	28.000	1.764
41	1999	May	31.087	31.000	87
42	1999	Jun	33.065	33.000	65
43	1999	Jul	32.964	35.000	(2.036)
44	1999	Aug	36.028	37.000	(972)

Sumber : Data sekunder perusahaan yang diolah peneliti

Pengukuran Kesalahan Peramalan Metode Judgmental Forecasting: Produk Jamu Pegelinu

waktu	error	AD	SE	APE	PE
(1)	(2)	(3)	(4)	(5)	(6)
1	(950)	950	902.500	9,45%	-9,45%
2	(2.386)	2.386	5.692.996	24,82%	-24,82%
3	(1.316)	1.316	1.731.856	11,77%	-11,77%
4	(390)	390	152.100	3,09%	-3,09%
5	523	523	273.529	3,60%	3,60%
6	(571)	571	326.041	3,96%	-3,96%
7	722	722	521.284	4,59%	4,59%
8	(313)	313	97.969	1,93%	-1,93%
9	(402)	402	161.604	2,42%	-2,42%
10	363	363	131.769	1,98%	1,98%
11	259	259	67.081	1,34%	1,34%
12	(3.470)	3.470	12.040.900	20,99%	-20,99%
13	(3.814)	3.814	14.546.596	28,92%	-28,92%
14	694	694	481.636	4,42%	4,42%
15	(1.930)	1.930	3.724.900	10,68%	-10,68%
16	922	922	850.084	5,14%	5,14%
17	2.258	2.258	5.098.564	10,62%	10,62%
18	1.449	1.449	2.089.601	6,76%	6,76%
19	(1.376)	1.376	1.893.376	6,67%	-6,67%
20	(1.292)	1.292	1.669.264	5,95%	-5,95%
21	(1.626)	1.626	2.643.876	7,98%	-7,98%
22	(1.090)	1.090	1.188.100	5,76%	-5,76%
23	(2.063)	2.063	4.255.969	12,94%	-12,94%
24	3.281	3.281	10.764.961	14,09%	14,09%
25	(6.113)	6.113	37.368.769	32,37%	-32,37%
26	(1.573)	1.573	2.474.329	8,10%	-8,10%
27	3.650	3.650	13.322.500	16,11%	16,11%
28	2.020	2.020	4.080.400	8,07%	8,07%
29	1.564	1.564	2.446.096	5,89%	5,89%
30	(746)	746	566.516	2,74%	-2,74%
31	(891)	891	793.881	3,17%	-3,17%
32	(1.553)	1.553	2.411.809	5,46%	-5,46%
33	(4.078)	4.078	16.630.084	14,60%	-14,60%
34	(1.230)	1.230	1.512.900	4,43%	-4,43%
35	(495)	495	245.025	1,68%	-1,68%
36	(1.379)	1.379	1.901.641	4,50%	-4,50%
37	(4.325)	4.325	18.705.625	20,92%	-20,92%
38	423	423	178.929	1,66%	1,66%
39	(563)	563	316.969	2,13%	-2,13%
40	1.764	1.764	3.111.696	5,93%	5,93%
41	87	87	7.569	0,28%	0,28%
42	65	65	4.225	0,20%	0,20%
43	(2.036)	2.036	4.145.296	6,18%	-6,18%
44	(972)	972	944.784	2,70%	-2,70%

Metode Judgmental Forecasting			
MAD	MSE	MAPE	MPE
1.567,89	4.147.172,70	8,11%	-3,99%
Batas toleransi kesalahan peramalan =		3991,463223	

Sumber : Data sekunder perusahaan yang diolah peneliti

Data Penjualan Aktual dan Ramalan Penjualan berdasarkan Metode Judgmental Forecasting; Produk Jamu Gempur Angin

waktu			Data Aktual	Data Ramalan	error
(1)	(2)	(3)	(4)	(5)	(6)
1	1996	Jan	4.915	4.700	215
2	1996	Feb	5.711	5.300	411
3	1996	Mar	6.541	5.900	641
4	1996	Apr	7.299	6.700	599
5	1996	May	6.638	7.500	(862)
6	1996	Jun	8.314	8.000	314
7	1996	Jul	8.353	8.500	(147)
8	1996	Aug	9.029	8.900	129
9	1996	Sep	9.498	9.000	498
10	1996	Oct	10.518	9.500	1.018
11	1996	Nop	10.026	10.500	(474)
12	1996	Dec	9.129	10.200	(1.071)
13	1997	Jan	6.900	8.500	(1.600)
14	1997	Feb	6.840	7.500	(660)
15	1997	Mar	7.300	7.000	300
16	1997	Apr	8.289	7.600	689
17	1997	May	7.407	7.900	(493)
18	1997	Jun	7.726	7.300	426
19	1997	Jul	7.209	7.700	(491)
20	1997	Aug	7.173	7.500	(327)
21	1997	Sep	8.289	7.300	989
22	1997	Oct	8.978	8.000	978
23	1997	Nop	9.413	9.000	413
24	1997	Dec	9.526	10.300	(774)
25	1998	Jan	7.555	8.000	(445)
26	1998	Feb	7.964	7.500	464
27	1998	Mar	7.263	8.200	(937)
28	1998	Apr	7.919	7.900	19
29	1998	May	8.254	8.500	(246)
30	1998	Jun	9.183	9.000	183
31	1998	Jul	9.771	9.500	271
32	1998	Aug	9.628	10.100	(472)
33	1998	Sep	12.648	10.800	1.848
34	1998	Oct	12.109	12.500	(391)
35	1998	Nop	11.048	12.500	(1.452)
36	1998	Dec	13.749	15.000	(1.251)
37	1999	Jan	8.975	10.000	(1.025)
38	1999	Feb	8.476	9.000	(524)
39	1999	Mar	8.165	8.500	(335)
40	1999	Apr	9.153	8.500	653
41	1999	May	9.387	9.000	387
42	1999	Jun	8.778	9.500	(722)
43	1999	Jul	9.189	9.500	(311)
44	1999	Aug	9.687	10.500	(813)

Sumber: Data sekunder perusahaan yang diolah peneliti

Pengukuran Kesalahan Peramalan Metode Judgmental Forecasting: Produk Jamu Gempur Angin

waktu	error	AD	SE	APE	PE
(1)		(2)	(3)	(4)	(5)
1	215	215	46.225	4,37%	4,37%
2	411	411	168.921	7,20%	7,20%
3	641	641	410.881	9,80%	9,80%
4	599	599	358.801	8,21%	8,21%
5	(862)	862	743.044	12,99%	-12,99%
6	314	314	98.596	3,78%	3,78%
7	(147)	147	21.609	1,76%	-1,76%
8	129	129	16.641	1,43%	1,43%
9	498	498	248.004	5,24%	5,24%
10	1.018	1.018	1.036.324	9,68%	9,68%
11	(474)	474	224.676	4,73%	-4,73%
12	(1.071)	1.071	1.147.041	11,73%	-11,73%
13	(1.600)	1.600	2.560.000	23,19%	-23,19%
14	(660)	660	435.600	9,65%	-9,65%
15	300	300	90.000	4,11%	4,11%
16	689	689	474.721	8,31%	8,31%
17	(493)	493	249.049	6,66%	-6,66%
18	426	426	181.476	5,51%	5,51%
19	(491)	491	241.081	6,81%	-6,81%
20	(327)	327	106.929	4,56%	-4,56%
21	989	989	978.121	11,93%	11,93%
22	978	978	956.484	10,89%	10,89%
23	413	413	170.569	4,39%	4,39%
24	(774)	774	599.076	8,13%	-8,13%
25	(445)	445	198.025	5,89%	-5,89%
26	464	464	215.296	5,83%	5,83%
27	(937)	937	877.969	12,90%	-12,90%
28	19	19	361	0,24%	0,24%
29	(246)	246	60.516	2,98%	-2,98%
30	183	183	33.489	1,99%	1,99%
31	271	271	73.441	2,77%	2,77%
32	(472)	472	222.784	4,90%	-4,90%
33	1.848	1.848	3.415.104	14,61%	14,61%
34	(391)	391	152.861	3,23%	-3,23%
35	(1.452)	1.452	2.108.304	13,14%	-13,14%
36	(1.251)	1.251	1.565.001	9,10%	-9,10%
37	(1.025)	1.025	1.050.625	11,42%	-11,42%
38	(524)	524	274.576	6,18%	-6,18%
39	(335)	335	112.225	4,10%	-4,10%
40	653	653	426.409	7,13%	7,13%
41	387	387	149.769	4,12%	4,12%
42	(722)	722	521.284	8,23%	-8,23%
43	(311)	311	96.721	3,38%	-3,38%
44	(813)	813	660.969	8,39%	-8,39%

Metode Judgmental Forecasting			
MAD	MSE	MAPE	MPE
619.727,2727	540.309,50	7,17%	-1,19%
Batas toleransi kesalahan peramalan =		1.440,71	

Sumber: Data sekunder perusahaan yang diolah peneliti

LAMPIRAN 2
METODE PERAMALAN RATA-RATA BERGERAK
D SERTA
PENGUKURAN KESALAHAN PERAMALANNYA



Produk Jamu Galian Singset

Melode Rata-rata Bergerak

waktu	(Y)	total RRB 3 bulan	RRB 3 bulan (Y)	error	total RRB 5 bulan	RRB 5 bulan (Y)	error
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Jan '96	6.344					
2	Feb '96	6.511					
3	Mar '96	6.539	19.394				
4	Apr '96	6.644	19.694	6.464,67	179,33		
5	May '96	6.779	19.962	6.564,67	214,33	32.817	
6	Jun '96	6.412	19.635	6.654,00	(242,00)	32.885	6.563,40 (151,40)
7	Jul '96	5.799	18.990	6.611,67	(812,67)	32.173	6.577,00 (778,00)
8	Aug '96	6.262	18.473	6.330,00	(68,00)	31.896	6.434,60 (172,60)
9	Sep '96	6.209	18.270	6.157,67	51,33	31.461	6.379,20 (170,20)
10	Oct '96	5.510	17.981	6.090,00	(580,00)	30.192	6.292,20 (782,20)
11	Nov '96	5.376	17.095	5.993,67	(617,67)	29.156	6.038,40 (662,40)
12	Dec '96	5.750	16.636	5.698,33	51,67	29.107	5.831,20 (81,20)
13	Jan '97	6.426	17.552	5.545,33	880,67	29.271	5.821,40 604,60
14	Feb '97	6.124	18.300	5.850,67	273,33	29.186	5.854,20 269,80
15	Mar '97	6.220	18.770	6.100,00	120,00	29.896	5.837,20 382,80
16	Apr '97	7.221	19.565	6.256,67	964,33	31.741	5.979,20 1.241,80
17	May '97	6.786	20.227	6.521,67	264,33	32.777	6.348,20 437,80
18	Jun '97	6.973	20.980	6.742,33	230,67	33.324	6.555,40 417,60
19	Jul '97	7.401	21.160	6.993,33	407,67	34.601	6.664,80 736,20
20	Aug '97	7.300	21.674	7.053,33	246,67	35.681	6.920,20 379,80
21	Sep '97	7.464	22.165	7.224,67	239,33	35.924	7.136,20 327,80
22	Oct '97	6.041	20.805	7.388,33	(1.347,33)	35.179	7.184,80 (1.143,80)
23	Nov '97	5.871	19.376	6.935,00	(1.064,00)	34.077	7.035,80 (1.164,80)
24	Dec '97	5.739	17.651	6.458,67	(719,67)	32.415	6.815,40 (1.076,40)
25	Jan '98	5.889	17.499	5.883,67	5,33	31.004	6.483,00 (594,00)
26	Feb '98	5.243	16.871	5.833,00	(590,00)	28.783	6.200,80 (957,80)
27	Mar '98	3.236	14.368	5.623,67	(2.387,67)	25.978	5.756,60 (2.520,60)
28	Apr '98	3.293	11.772	4.789,33	(1.496,33)	23.400	5.195,60 (1.902,60)
29	May '98	3.596	10.125	3.924,00	(328,00)	21.257	4.680,00 (1.084,00)
30	Jun '98	3.770	10.659	3.375,00	395,00	19.138	4.251,40 (481,40)
31	Jul '98	3.786	11.152	3.553,00	233,00	17.681	3.827,60 (41,60)
32	Aug '98	3.878	11.434	3.717,33	160,67	18.328	3.536,20 341,80
33	Sep '98	4.369	12.033	3.811,33	557,67	19.399	3.664,60 704,40
34	Oct '98	4.216	12.463	4.011,00	205,00	20.019	3.879,80 336,20
35	Nov '98	4.424	13.009	4.154,33	269,67	20.673	4.003,80 420,20
36	Dec '98	4.639	13.279	4.336,33	302,67	21.526	4.134,60 504,40
37	Jan '99	4.186	13.249	4.426,33	(240,33)	21.834	4.305,20 (119,20)
38	Feb '99	3.800	12.625	4.416,33	(616,33)	21.265	4.366,80 (566,80)
39	Mar '99	3.735	11.721	4.208,33	(473,33)	20.784	4.253,00 (518,00)
40	Apr '99	3.389	10.924	3.907,00	(518,00)	19.749	4.156,80 (767,80)
41	May '99	3.562	10.686	3.641,33	(79,33)	18.672	3.949,80 (387,80)
42	Jun '99	3.665	10.616	3.562,00	103,00	18.151	3.734,40 (69,40)
43	Jul '99	4.217	11.444	3.538,67	678,33	18.568	3.630,20 586,80
44	Aug '99	3.904	11.786	3.814,67	89,33	18.737	3.713,60 190,40
	Sep '99			3.928,67			3.747,40

Sumber: data sekunder perusahaan yang diolah peneliti

Keterangan :

(3) y = Data aktual = data realisasi penjualan

(4), (7) Total Rata-rata Bergerak dengan periode 3 bulan, 5 bulan

(5), (8) Y' = merupakan data peramalan

(6), (9) $error = Y - Y' =$ Kesalahan Peramalan = kolom (3) - kolom (5)
Kesalahan Peramalan = kolom (3) - kolom (8)



Pengukuran Kesalahan Peramalan Metode Rata-rata Bergerak Produk Jamu Galian Singset

waktu	Rata-rata Bergerak 3 bulan				Rata-rata Bergerak dengan 5 bulan			
	AD	SE	APE	PE	AD	SE	APE	PE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1								
2								
3								
4	179,33	32.160,44	2,70%	2,70%				
5	214,33	45.938,78	3,16%	3,16%				
6	242,00	58.564,00	3,77%	-3,77%	151,40	22.921,96	2,36%	-2,36%
7	812,67	660.427,11	14,01%	-14,01%	778,00	605.284,00	13,42%	-13,42%
8	68,00	4.624,00	1,09%	-1,09%	172,60	29.790,76	2,76%	-2,76%
9	51,33	2.635,11	0,83%	0,83%	170,20	28.968,04	2,74%	-2,74%
10	580,00	336.400,00	10,53%	-10,53%	782,20	611.836,84	14,20%	-14,20%
11	617,67	381.512,11	11,49%	-11,49%	662,40	438.773,76	12,32%	-12,32%
12	51,67	2.669,44	0,90%	0,90%	81,20	6.593,44	1,41%	-1,41%
13	880,67	775.573,78	13,70%	13,70%	604,60	365.541,16	9,41%	9,41%
14	273,33	74.711,11	4,46%	4,46%	269,80	72.792,04	4,41%	4,41%
15	120,00	14.400,00	1,93%	1,93%	382,80	146.535,84	6,15%	6,15%
16	964,33	929.938,78	13,35%	13,35%	1.241,80	1.542.067,24	17,20%	17,20%
17	264,33	69.872,11	3,90%	3,90%	437,80	191.668,84	6,45%	6,45%
18	230,67	53.207,11	3,31%	3,31%	417,60	174.389,76	5,99%	5,99%
19	407,67	166.192,11	5,51%	5,51%	736,20	541.990,44	9,95%	9,95%
20	246,67	60.844,44	3,38%	3,38%	379,80	144.248,04	5,20%	5,20%
21	239,33	57.280,44	3,21%	3,21%	327,80	107.452,84	4,39%	4,39%
22	1.347,33	1.815.307,11	22,30%	-22,30%	1.143,80	1.308.278,44	18,93%	-18,93%
23	1.064,00	1.132.096,00	18,12%	-18,12%	1.164,80	1.356.759,04	19,84%	-19,84%
24	719,67	517.920,11	12,54%	-12,54%	1.076,40	1.158.636,96	18,76%	-18,76%
25	5,33	28,44	0,09%	0,09%	594,00	352.836,00	10,09%	-10,09%
26	590,00	348.100,00	11,25%	-11,25%	957,80	917.380,84	18,27%	-18,27%
27	2.387,67	5.700.952,11	73,78%	-73,78%	2.520,60	6.353.424,36	77,89%	-77,89%
28	1.496,33	2.239.013,44	45,44%	-45,44%	1.902,60	3.619.886,76	57,78%	-57,78%
29	328,00	107.584,00	9,12%	-9,12%	1.084,00	1.175.056,00	30,14%	-30,14%
30	385,00	156.025,00	10,48%	10,48%	481,40	231.745,96	12,77%	-12,77%
31	233,00	54.289,00	6,15%	6,15%	41,60	1.730,56	1,10%	-1,10%
32	160,67	25.813,78	4,14%	4,14%	341,80	116.827,24	8,81%	8,81%
33	557,67	310.992,11	12,76%	12,76%	704,40	496.179,36	16,12%	16,12%
34	205,00	42.025,00	4,86%	4,86%	336,20	113.030,44	7,97%	7,97%
35	269,67	72.720,11	6,10%	6,10%	420,20	176.568,04	9,50%	9,50%
36	302,67	91.607,11	6,52%	6,52%	504,40	254.419,36	10,87%	10,87%
37	240,33	57.760,11	5,74%	-5,74%	119,20	14.208,64	2,85%	-2,85%
38	616,33	379.866,78	16,22%	-16,22%	566,80	321.262,24	14,92%	-14,92%
39	473,33	224.044,44	12,67%	-12,67%	518,00	268.324,00	13,87%	-13,87%
40	518,00	268.324,00	15,28%	-15,28%	767,80	589.516,84	22,66%	-22,66%
41	79,33	6.293,78	2,23%	-2,23%	387,80	150.388,84	10,89%	-10,89%
42	103,00	10.609,00	2,81%	2,81%	69,40	4.816,36	1,89%	-1,89%
43	678,33	460.136,11	16,09%	16,09%	586,80	344.334,24	13,92%	13,92%
44	89,33	7.980,44	2,29%	2,29%	190,40	36.252,16	4,88%	4,88%

Rata-rata Bergerak 3 bulan				Rata-rata Bergerak dengan 5 bulan			
MAD	MSE	MAPE	MPE	MAD	MSE	MAPE	MPE
470,83	433.083,88	10,20%	-3,73%	617,34	625.454,30	13,41%	-6,17%
Batas toleransi kesalahan peramalan = 1289,86				Batas toleransi kesalahan peramalan = 1.550,08			

Sumber: Data sekunder perusahaan yang diolah peneliti

Keterangan :

(2), (6) AD = Absolute Deviation = $|Y - Y^*|$, merupakan error yang diabsolutkan

(3), (7) SE = Square Error, merupakan error yang dikuadratkan

(4), (8) APE = Absolute Percentage Error = AD / Y

(5), (9) PE = Percentage Error = $error / Y$

Jumlah waktu peramalan (n) : RRB 3 bulan= 41 bulan, RRB 5 bulan = 39 bulan



Produk Jamu Pegelinu

Metode Rata-rata Bergerak

waktu		(Y)	total RRB 3 bulan	RRB 3 bulan (Y')	error	total RRB n = 5	RRB 5 bulan (Y')	error
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Jan '96	10.050						
2	Feb '96	9.614						
3	Mar '96	11.184	30.848					
4	Apr '96	12.610	33.408	10.282,67	2.327,33			
5	May '96	14.523	38.317	11.136,00	3.387,00	57.981		
6	Jun '96	14.429	41.562	12.772,33	1.656,67	62.360	11.596,20	2.832,80
7	Jul '96	15.722	44.674	13.854,00	1.868,00	68.468	12.472,00	3.250,00
8	Aug '96	16.187	46.338	14.891,33	1.295,67	73.471	13.693,60	2.493,40
9	Sep '96	16.598	48.507	15.446,00	1.152,00	77.459	14.694,20	1.903,80
10	Oct '96	18.363	51.148	16.169,00	2.194,00	81.299	15.491,80	2.871,20
11	Nov '96	19.259	54.220	17.049,33	2.209,67	86.129	16.259,80	2.989,20
12	Dec '96	16.530	54.152	18.073,33	(1.543,33)	86.937	17.225,80	(695,80)
13	Jan '97	13.186	48.975	18.060,67	(4.864,67)	83.936	17.387,40	(4.201,40)
14	Feb '97	15.894	45.410	16.325,00	(631,00)	83.032	16.787,20	(1.093,20)
15	Mar '97	18.070	46.950	15.136,67	2.933,33	82.739	16.606,40	1.463,60
16	Apr '97	17.922	51.686	15.650,00	2.272,00	81.402	16.547,80	1.374,20
17	May '97	21.258	57.250	17.228,67	4.029,33	86.130	16.280,40	4.977,60
18	Jun '97	21.449	60.629	19.083,33	2.365,67	94.393	17.226,00	4.223,00
19	Jul '97	20.624	63.331	20.209,67	414,33	99.323	18.878,60	1.745,40
20	Aug '97	21.708	63.781	21.110,33	597,67	102.961	19.864,60	1.843,40
21	Sep '97	20.374	62.706	21.260,33	(886,33)	105.413	20.592,20	(218,20)
22	Oct '97	18.910	60.982	20.902,00	(1.992,00)	103.065	21.082,60	(2.172,60)
23	Nov '97	15.937	55.221	20.330,67	(4.393,67)	97.553	20.613,00	(4.676,00)
24	Dec '97	23.281	58.128	18.407,00	4.874,00	100.210	19.510,60	3.770,40
25	Jan '98	18.887	58.105	19.376,00	(489,00)	97.389	20.042,00	(1.155,00)
26	Feb '98	19.427	61.595	19.368,33	58,67	96.442	19.477,80	(50,80)
27	Mar '98	22.650	60.964	20.531,67	2.118,33	100.182	19.288,40	3.361,60
28	Apr '98	25.020	67.097	20.321,33	4.698,67	109.265	20.036,40	4.983,60
29	May '98	26.564	74.234	22.365,67	4.198,33	112.548	21.853,00	4.711,00
30	Jun '98	27.254	78.838	24.744,67	2.509,33	120.915	22.509,60	4.744,40
31	Jul '98	28.109	81.927	26.279,33	1.829,67	129.597	24.183,00	3.926,00
32	Aug '98	28.447	83.810	27.309,00	1.138,00	135.394	25.919,40	2.527,60
33	Sep '98	27.922	84.478	27.936,67	(14,67)	138.296	27.078,80	843,20
34	Oct '98	27.770	84.139	28.159,33	(389,33)	139.502	27.659,20	110,80
35	Nov '98	29.505	85.197	28.046,33	1.458,67	141.753	27.900,40	1.604,60
36	Dec '98	30.621	87.896	28.399,00	2.222,00	144.265	28.350,60	2.270,40
37	Jan '99	20.675	80.801	29.298,67	(8.623,67)	136.493	28.853,00	(8.178,00)
38	Feb '99	25.423	76.719	26.933,67	(1.510,67)	133.994	27.298,60	(1.875,60)
39	Mar '99	26.437	72.535	25.573,00	864,00	132.661	26.798,80	(361,80)
40	Apr '99	29.764	81.624	24.178,33	5.585,67	132.920	26.532,20	3.231,80
41	May '99	31.087	87.288	27.208,00	3.879,00	133.386	26.584,00	4.503,00
42	Jun '99	33.064	93.915	29.096,00	3.968,00	145.775	26.677,20	6.386,80
43	Jul '99	32.965	97.116	31.305,00	1.660,00	153.317	29.155,00	3.810,00
44	Aug '99	36.028	102.057	32.372,00	3.656,00	162.908	30.663,40	5.364,60
	Sep '99			34.019,00			32.581,60	

Sumber: Data sekunder perusahaan yang diolah peneliti

Pengukuran Kesalahan Peramalan Metode Rata-rata Bergerak Produk Jamu Pegelmu

waktu	Rata-rata Bergerak 3 bulan				Rata-rata Bergerak 5 bulan			
	AD	SE	APE	PE	AD	SE	APE	PE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1								
2								
3								
4	2.327,33	5.416.480,44	18,46%	18,46%				
5	3.387,00	11.471.769,00	23,32%	23,32%				
6	1.656,67	2.744.544,44	11,48%	11,48%	2.832,80	8.024.755,84	19,63%	19,63%
7	1.868,00	3.489.424,00	11,88%	11,88%	3.250,00	10.562.500,00	20,67%	20,67%
8	1.295,67	1.678.752,11	8,00%	8,00%	2.493,40	6.217.043,56	15,40%	15,40%
9	1.152,00	1.327.104,00	6,94%	6,94%	1.903,80	3.624.454,44	11,47%	11,47%
10	2.194,00	4.813.636,00	11,95%	11,95%	2.871,20	8.243.789,44	15,64%	15,64%
11	2.209,67	4.882.626,78	11,47%	11,47%	2.999,20	8.995.200,64	15,57%	15,57%
12	1.543,33	2.381.877,78	9,34%	-9,34%	695,80	484.137,64	4,21%	-4,21%
13	4.864,67	23.664.981,78	36,89%	-36,89%	4.201,40	17.661.761,96	31,86%	-31,86%
14	631,00	398.161,00	4,02%	-4,02%	1.093,20	1.195.086,24	6,97%	-6,97%
15	2.933,33	8.604.444,44	16,23%	16,23%	1.463,60	2.142.124,96	8,10%	8,10%
16	2.272,00	5.161.984,00	12,68%	12,68%	1.374,20	1.888.425,64	7,67%	7,67%
17	4.029,33	16.235.527,11	18,95%	18,95%	4.977,60	24.776.501,76	23,42%	23,42%
18	2.365,67	5.596.378,78	11,03%	11,03%	4.223,00	17.833.729,00	19,69%	19,69%
19	414,33	171.672,11	2,01%	2,01%	1.745,40	3.046.421,16	8,46%	8,46%
20	597,67	357.205,44	2,75%	2,75%	1.843,40	3.398.123,56	8,49%	8,49%
21	686,33	785.586,78	4,35%	-4,35%	218,20	47.611,24	1,07%	-1,07%
22	1.992,00	3.968.064,00	10,53%	-10,53%	2.172,60	4.720.190,76	11,49%	-11,49%
23	4.393,67	19.304.306,78	27,57%	-27,57%	4.676,00	21.864.976,00	29,34%	-29,34%
24	4.874,00	23.755.876,00	20,94%	20,94%	3.770,40	14.215.916,16	16,20%	16,20%
25	489,00	239.121,00	2,59%	-2,59%	1.155,00	1.334.025,00	6,12%	-6,12%
26	58,67	3.441,78	0,30%	0,30%	50,80	2.580,64	0,26%	-0,26%
27	2.118,33	4.487.336,11	9,35%	9,35%	3.361,60	11.300.354,56	14,84%	14,84%
28	4.698,67	22.077.468,44	18,78%	18,78%	4.983,60	24.836.268,96	19,92%	19,92%
29	4.198,33	17.626.002,78	15,80%	15,80%	4.711,00	22.193.521,00	17,73%	17,73%
30	2.509,33	6.296.753,78	9,21%	9,21%	4.744,40	22.509.331,36	17,41%	17,41%
31	1.829,67	3.347.680,11	6,51%	6,51%	3.926,00	15.413.476,00	13,97%	13,97%
32	1.138,00	1.295.044,00	4,00%	4,00%	2.527,60	6.388.761,76	8,89%	8,89%
33	14,67	215,11	0,05%	-0,05%	843,20	710.986,24	3,02%	3,02%
34	389,33	151.580,44	1,40%	-1,40%	110,80	12.276,64	0,40%	0,40%
35	1.458,67	2.127.708,44	4,94%	4,94%	1.604,60	2.574.741,16	5,44%	5,44%
36	2.222,00	4.937.284,00	7,26%	7,26%	2.270,40	5.154.716,16	7,41%	7,41%
37	8.623,67	74.367.626,78	41,71%	-41,71%	8.178,00	66.879.684,00	39,56%	-39,56%
38	1.510,67	2.282.113,78	5,94%	-5,94%	1.875,60	3.517.875,36	7,38%	-7,38%
39	864,00	746.496,00	3,27%	3,27%	361,80	130.899,24	1,37%	-1,37%
40	5.585,67	31.199.672,11	18,77%	18,77%	3.231,80	10.444.531,24	10,86%	10,86%
41	3.879,00	15.046.641,00	12,48%	12,48%	4.503,00	20.277.009,00	14,49%	14,49%
42	3.968,00	15.745.024,00	12,00%	12,00%	6.386,80	40.791.214,24	19,32%	19,32%
43	1.660,00	2.755.600,00	5,04%	5,04%	3.810,00	14.516.100,00	11,56%	11,56%
44	3.656,00	13.366.336,00	10,15%	10,15%	5.364,60	28.778.933,16	14,89%	14,89%

Rata-rata Bergerak 3 bulan				Rata-rata Bergerak 5 bulan			
MAD	MSE	MAPE	MPE	MAD	MSE	MAPE	MPE
2.408,76	8.885.598,74	11,47%	4,43%	2.692,46	11.710.257,33	13,08%	5,92%
Batas toleransi kesalahan peramalan = 5.842,51				Batas toleransi kesalahan peramalan = 6.707,17			

Sumber: Data sekunder perusahaan yang diolah peneliti

Produk Jamu Gempur Angin

Metode Rata-rata Bergerak

waktu	(Y)	total RRB n=3	RRB 3 bulan (Y')	error	total RRB n=5	RRB 5 bulan (Y')	error
(1)	(2)	(3)	(5)	(6)	(7)	(8)	(9)
1	Jan '96	4.915					
2	Feb '96	5.711					
3	Mar '96	6.541	17.167				
4	Apr '96	7.299	19.551	5.722,33	1.576,67		
5	May '96	6.638	20.478	6.517,00	121,00	31.104	
6	Jun '96	8.314	22.251	6.826,00	1.488,00	34.503	6.220,80
7	Jul '96	8.353	23.305	7.417,00	936,00	37.145	6.900,60
8	Aug '96	9.029	25.696	7.768,33	1.260,67	39.633	7.429,00
9	Sep '96	9.498	26.880	8.565,33	932,67	41.832	7.926,60
10	Oct '96	10.518	29.045	8.960,00	1.558,00	45.712	8.366,40
11	Nov '96	10.026	30.042	9.681,67	344,33	47.424	9.142,40
12	Dec '96	9.129	29.673	10.014,00	(885,00)	48.200	9.484,80
13	Jan '97	6.900	26.055	9.691,00	(2.991,00)	46.071	9.640,00
14	Feb '97	6.840	22.869	8.685,00	(1.845,00)	43.413	9.214,20
15	Mar '97	7.300	21.040	7.623,00	(323,00)	40.195	8.682,60
16	Apr '97	8.289	22.429	7.013,33	1.275,67	38.458	8.039,00
17	May '97	7.407	22.996	7.476,33	(69,33)	36.736	7.691,60
18	Jun '97	7.726	23.422	7.665,33	60,67	37.562	7.347,20
19	Jul '97	7.209	22.342	7.807,33	(598,33)	37.931	7.512,40
20	Aug '97	7.173	22.108	7.447,33	(274,33)	37.804	7.586,20
21	Sep '97	8.289	22.671	7.369,33	919,67	37.804	7.560,80
22	Oct '97	8.978	24.440	7.557,00	1.421,00	39.375	7.560,80
23	Nov '97	9.413	26.680	8.146,67	1.266,33	41.062	7.875,00
24	Dec '97	9.526	27.917	8.893,33	632,67	43.379	8.212,40
25	Jan '98	7.555	26.494	9.305,67	(1.750,67)	43.761	8.675,80
26	Feb '98	7.964	25.045	8.831,33	(867,33)	43.436	8.752,20
27	Mar '98	7.263	22.782	8.348,33	(1.085,33)	41.721	8.687,20
28	Apr '98	7.919	23.146	7.694,00	325,00	40.227	8.344,20
29	May '98	8.254	23.436	7.715,33	538,67	38.956	8.045,40
30	Jun '98	9.183	25.356	7.812,00	1.371,00	40.583	7.791,00
31	Jul '98	9.771	27.208	8.452,00	1.319,00	42.390	8.116,60
32	Aug '98	9.628	28.582	9.069,33	558,67	44.755	8.478,00
33	Sep '98	12.648	32.047	9.527,33	3.120,67	49.484	8.951,00
34	Oct '98	12.109	34.385	10.682,33	1.426,67	53.339	9.896,80
35	Nov '98	11.048	35.805	11.461,67	(413,67)	55.204	10.667,80
36	Dec '98	10.749	33.906	11.935,00	(1.186,00)	56.182	11.040,80
37	Jan '99	8.975	30.772	11.302,00	(2.327,00)	55.529	11.236,40
38	Feb '99	8.476	28.200	10.257,33	(1.781,33)	51.357	11.105,80
39	Mar '99	8.165	25.616	9.400,00	(1.235,00)	47.413	10.271,40
40	Apr '99	9.153	25.794	8.538,67	614,33	45.518	9.482,60
41	May '99	9.387	26.705	8.598,00	789,00	44.156	9.103,60
42	Jun '99	8.778	27.318	8.901,67	(123,67)	43.959	8.831,20
43	Jul '99	9.189	27.354	9.106,00	83,00	44.672	8.791,80
44	Aug '99	9.681	27.648	9.118,00	563,00	46.188	8.934,40
	Sep '99			9.216,00			9.237,60

Sumber: Data sekunder perusahaan yang diolah peneliti

Pengukuran Kesalahan Peramalan Metode Rata-rata Bergerak Produk Jamu Gempur Angin

waktu	Rata-rata Bergerak 3 bulan				Rata-rata Bergerak 5 bulan			
	AD	SE	APE	PE	AD	SE	APE	PE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1								
2								
3								
4	1.576,67	2.485.877,78	21,60%	21,60%				
5	121,00	14.641,00	1,82%	1,82%				
6	1.488,00	2.214.144,00	17,90%	17,90%	2.093,20	4.381.486,24	25,18%	25,18%
7	936,00	876.096,00	11,21%	11,21%	1.452,40	2.109.465,76	17,39%	17,39%
8	1.260,67	1.589.280,44	13,96%	13,96%	1.600,00	2.560.000,00	17,72%	17,72%
9	932,67	869.867,11	9,82%	9,82%	1.571,40	2.469.297,96	16,54%	16,54%
10	1.558,00	2.427.364,00	14,81%	14,81%	2.151,60	4.629.382,56	20,46%	20,46%
11	344,33	118.565,44	3,43%	3,43%	883,60	780.748,96	8,81%	8,81%
12	885,00	783.225,00	9,69%	-9,69%	355,80	126.593,64	3,90%	-3,90%
13	2.991,00	8.946.081,00	43,35%	-43,35%	2.740,00	7.507.600,00	39,71%	-39,71%
14	1.845,00	3.404.025,00	26,97%	-26,97%	2.374,20	5.636.825,64	34,71%	-34,71%
15	323,00	104.329,00	4,42%	-4,42%	1.382,60	1.911.582,76	18,94%	-18,94%
16	1.275,67	1.627.325,44	15,39%	15,39%	250,00	62.500,00	3,02%	3,02%
17	69,33	4.807,11	0,94%	-0,94%	284,60	80.997,16	3,84%	-3,84%
18	60,67	3.680,44	0,79%	0,79%	378,80	143.489,44	4,90%	4,90%
19	598,33	358.002,78	8,30%	-8,30%	303,40	92.051,56	4,21%	-4,21%
20	274,33	75.258,78	3,82%	-3,82%	413,20	170.734,24	5,76%	-5,76%
21	919,67	845.786,78	11,10%	11,10%	728,20	530.275,24	8,79%	8,79%
22	1.421,00	2.019.241,00	15,83%	15,83%	1.417,20	2.008.455,84	15,79%	15,79%
23	1.266,33	1.603.600,11	13,45%	13,45%	1.538,00	2.365.444,00	16,34%	16,34%
24	632,67	400.267,11	6,64%	6,64%	1.313,60	1.725.544,96	13,79%	13,79%
25	1.750,67	3.064.833,78	23,17%	-23,17%	1.120,80	1.256.192,64	14,84%	-14,84%
26	867,33	752.267,11	10,89%	-10,89%	788,20	621.259,24	9,90%	-9,90%
27	1.085,33	1.177.948,44	14,94%	-14,94%	1.424,20	2.028.345,64	19,61%	-19,61%
28	325,00	105.625,00	4,10%	4,10%	425,20	180.795,04	5,37%	-5,37%
29	538,67	290.161,78	6,53%	6,53%	208,60	43.513,96	2,53%	2,53%
30	1.371,00	1.879.641,00	14,93%	14,93%	1.392,00	1.937.664,00	15,16%	15,16%
31	1.319,00	1.739.761,00	13,50%	13,50%	1.654,40	2.737.039,36	16,93%	16,93%
32	558,67	312.108,44	5,80%	5,80%	1.150,00	1.322.500,00	11,94%	11,94%
33	3.120,67	9.738.560,44	24,67%	24,67%	3.697,00	13.667.809,00	29,23%	29,23%
34	1.426,67	2.035.377,78	11,78%	11,78%	2.212,20	4.893.828,84	18,27%	18,27%
35	413,67	171.120,11	3,74%	-3,74%	380,20	144.552,04	3,44%	3,44%
36	1.185,00	1.406.596,00	11,03%	-11,03%	291,80	85.147,24	2,71%	-2,71%
37	2.327,00	5.414.929,00	25,93%	-25,93%	2.261,40	5.113.929,96	25,20%	-25,20%
38	1.781,33	3.173.148,44	21,02%	-21,02%	2.629,80	6.915.848,04	31,03%	-31,03%
39	1.235,00	1.525.225,00	15,13%	-15,13%	2.106,40	4.436.920,96	25,80%	-25,80%
40	614,33	377.405,44	6,71%	6,71%	329,60	108.636,16	3,60%	-3,60%
41	789,00	622.521,00	8,41%	8,41%	283,40	80.315,56	3,02%	3,02%
42	123,67	15.293,44	1,41%	-1,41%	53,20	2.830,24	0,61%	-0,61%
43	83,00	6.889,00	0,90%	0,90%	397,20	157.767,84	4,32%	4,32%
44	563,00	316.969,00	5,82%	5,82%	746,60	557.411,56	7,71%	7,71%

Rata-rata Bergerak 3 bulan				Rata-rata Bergerak 5 bulan			
MAD	MSE	MAPE	MPE	MAD	MSE	MAPE	MPE
1.030,69	1.562.874,31	11,85%	0,88%	1.199,59	2.194.481,62	13,62%	0,81%
Batas toleransi kesalahan peramalan = 2.465,92				Batas toleransi kesalahan peramalan = 2.903,50			

Sumber: Data sekunder perusahaan yang diteliti

LAMPIRAN 3
METODE PERAMALAN
PENGHALUSAN EKSPONENSIAL TUNGGAL
SERTA
PENGUKURAN KESALAHAN PERAMALANNYA



Produk Jamu Galian Singset

Metode Penghalusan Eksponensial Tunggal

waktu	(1)	(2)	(3)	smooth (Y) alpha = 0,9	error	smooth (Y) alpha = 0,8	error
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Jan '96	6.344					
2	Feb '96	6.511	6.344,00	167,00	6.344,00	167,00	
3	Mar '96	6.539	6.494,30	44,70	6.477,60	61,40	
4	Apr '96	6.644	6.534,53	109,47	6.526,72	117,28	
5	May '96	6.779	6.633,05	145,95	6.620,54	158,46	
6	Jun '96	6.412	6.764,41	(352,41)	6.747,31	(335,31)	
7	Jul '96	5.799	6.447,24	(648,24)	6.479,06	(680,06)	
8	Aug '96	6.262	5.863,82	398,18	5.935,01	326,99	
9	Sep '96	6.209	6.222,18	(13,18)	6.196,60	12,40	
10	Oct '96	5.510	6.210,32	(700,32)	6.206,52	(696,52)	
11	Nov '96	5.376	5.580,03	(204,03)	5.649,30	(273,30)	
12	Dec '96	5.750	5.396,40	353,60	5.430,66	319,34	
13	Jan '97	6.426	5.714,64	711,36	5.686,13	739,87	
14	Feb '97	6.124	6.354,86	(230,86)	6.278,03	(154,03)	
15	Mar '97	6.220	6.147,09	72,91	6.154,81	65,19	
16	Apr '97	7.221	6.212,71	1.008,29	6.206,96	1.014,04	
17	May '97	6.786	7.120,17	(334,17)	7.018,19	(232,19)	
18	Jun '97	6.973	6.819,42	153,58	6.832,44	140,56	
19	Jul '97	7.401	6.957,64	443,36	6.944,89	456,11	
20	Aug '97	7.300	7.356,66	(56,66)	7.309,78	(9,78)	
21	Sep '97	7.464	7.305,67	158,33	7.301,96	162,04	
22	Oct '97	6.041	7.448,17	(1.407,17)	7.431,59	(1.390,59)	
23	Nov '97	5.871	6.181,72	(310,72)	6.319,12	(448,12)	
24	Dec '97	5.739	5.902,07	(163,07)	5.960,62	(221,62)	
25	Jan '98	5.889	5.755,31	133,69	5.783,32	106,68	
26	Feb '98	5.243	5.875,63	(632,63)	5.867,86	(624,86)	
27	Mar '98	3.236	5.306,26	(2.070,26)	5.367,97	(2.131,97)	
28	Apr '98	3.293	3.443,03	(150,03)	3.662,39	(369,39)	
29	May '98	3.596	3.308,00	288,00	3.366,88	229,12	
30	Jun '98	3.770	3.567,20	202,80	3.550,18	219,82	
31	Jul '98	3.786	3.749,72	36,28	3.726,04	59,96	
32	Aug '98	3.878	3.782,37	95,63	3.774,01	103,99	
33	Sep '98	4.369	3.868,44	500,56	3.857,20	511,80	
34	Oct '98	4.216	4.318,94	(102,94)	4.266,64	(50,64)	
35	Nov '98	4.424	4.226,29	197,71	4.226,13	197,87	
36	Dec '98	4.639	4.404,23	234,77	4.384,43	254,57	
37	Jan '99	4.186	4.615,52	(429,52)	4.588,09	(402,09)	
38	Feb '99	3.800	4.228,95	(428,95)	4.266,42	(466,42)	
39	Mar '99	3.735	3.842,90	(107,90)	3.893,28	(158,28)	
40	Apr '99	3.389	3.745,79	(356,79)	3.766,66	(377,66)	
41	May '99	3.562	3.424,68	137,32	3.464,53	97,47	
42	Jun '99	3.665	3.548,27	116,73	3.542,51	122,49	
43	Jul '99	4.217	3.653,33	563,67	3.640,50	576,50	
44	Aug '99	3.904	4.160,63	(256,63)	4.101,70	(197,70)	
	Sep '99		3.929,66		3.943,54		

Sumber: Data sekunder perusahaan yang diolah peneliti

Keterangan :

(3) Y = Data aktual = data realisasi penjualan

(4), (6) Y' = Penghalusan Eksponensial Tunggal/Single Exponential Smoothing/SES

$$SES = \alpha \times Y(t-1) + ((1 - \alpha) \times Y'(t-1))$$

(5), (7) error = $Y - Y'$

karena pada periode ke 2(waktu baris ke 2) belum dapat ditentukan variabel Y'
maka variabel Y pada baris waktu 1 dijadikan variabel Y' pada baris waktu ke 2



Pengukuran Kesalahan Peramalan Metode Penghalusan Eksponensial Tunggal Produk Jamu Galian Singset

waktu	Metode Penghalusan Eksponensial Tunggal							
	Alpha = 0,9				Alpha = 0,8			
	AD	SE	APE	PE	AD	SE	APE	PE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1								
2	167,00	27.889,00	2,56%	2,56%	167,00	27.889,00	2,56%	2,56%
3	44,70	1.998,09	0,68%	0,68%	61,40	3.769,96	0,94%	0,94%
4	109,47	11.983,68	1,65%	1,65%	117,28	13.754,60	1,77%	1,77%
5	145,95	21.300,53	2,15%	2,15%	158,46	25.108,30	2,34%	2,34%
6	352,41	124.189,50	5,50%	-5,50%	335,31	112.431,99	5,23%	-5,23%
7	648,24	420.215,78	11,18%	-11,18%	680,06	462.484,00	11,73%	-11,73%
8	398,18	158.544,08	6,36%	6,36%	326,99	106.920,92	5,22%	5,22%
9	13,18	173,79	0,21%	-0,21%	12,40	153,70	0,20%	0,20%
10	700,32	490.445,64	12,71%	-12,71%	696,52	485.140,80	12,64%	-12,64%
11	204,03	41.628,99	3,80%	-3,80%	273,30	74.695,13	5,08%	-5,08%
12	353,60	125.030,71	6,15%	6,15%	319,34	101.977,51	5,55%	5,55%
13	711,36	506.032,60	11,07%	11,07%	739,87	547.404,41	11,51%	11,51%
14	230,86	53.298,20	3,77%	-3,77%	154,03	23.724,14	2,52%	-2,52%
15	72,91	5.316,39	1,17%	1,17%	65,19	4.250,35	1,05%	1,05%
16	1.008,29	1.016.651,47	13,96%	13,96%	1.014,04	1.028.274,98	14,04%	14,04%
17	334,17	111.670,17	4,92%	-4,92%	232,19	53.913,22	3,42%	-3,42%
18	153,58	23.587,71	2,20%	2,20%	140,56	19.757,55	2,02%	2,02%
19	443,36	196.566,57	5,99%	5,99%	456,11	208.038,44	6,16%	6,16%
20	56,66	3.210,83	0,78%	-0,78%	9,78	95,60	0,13%	-0,13%
21	158,33	25.069,52	2,12%	2,12%	162,04	26.258,42	2,17%	2,17%
22	1.407,17	1.980.117,96	23,29%	-23,29%	1.390,59	1.933.743,61	23,02%	-23,02%
23	310,72	96.544,85	5,29%	-5,29%	448,12	200.809,94	7,63%	-7,63%
24	163,07	26.592,37	2,84%	-2,84%	221,62	49.117,04	3,86%	-3,86%
25	133,69	17.873,77	2,27%	2,27%	105,68	11.167,26	1,79%	1,79%
26	632,63	400.221,62	12,07%	-12,07%	624,86	380.456,20	11,92%	-11,92%
27	2.070,26	4.285.989,19	63,98%	-63,98%	2.131,97	4.545.308,83	65,88%	-65,88%
28	150,03	22.507,89	4,56%	-4,56%	369,39	136.452,37	11,22%	-11,22%
29	288,00	82.942,48	8,01%	8,01%	229,12	52.496,47	6,37%	6,37%
30	202,80	41.127,73	5,38%	5,38%	219,82	48.322,69	5,83%	5,83%
31	36,28	1.316,24	0,96%	0,96%	59,96	3.595,78	1,58%	1,58%
32	95,63	9.144,71	2,47%	2,47%	103,99	10.814,54	2,68%	2,68%
33	500,56	250.563,12	11,46%	11,46%	511,80	261.937,80	11,71%	11,71%
34	102,94	10.597,41	2,44%	-2,44%	50,64	2.564,44	1,20%	-1,20%
35	197,71	39.087,52	4,47%	4,47%	197,87	39.153,31	4,47%	4,47%
36	234,77	55.117,22	5,06%	5,06%	254,57	64.808,12	5,49%	5,49%
37	429,52	184.489,96	10,26%	-10,26%	402,09	161.672,45	9,61%	-9,61%
38	428,95	184.000,07	11,29%	-11,29%	465,42	217.544,84	12,27%	-12,27%
39	107,90	11.641,38	2,89%	-2,89%	158,28	25.053,64	4,24%	-4,24%
40	356,79	127.298,76	10,53%	-10,53%	377,66	142.624,57	11,14%	-11,14%
41	137,32	18.857,07	3,86%	3,86%	97,47	9.500,14	2,74%	2,74%
42	116,73	13.626,38	3,19%	3,19%	122,49	15.004,71	3,34%	3,34%
43	563,67	317.727,49	13,37%	13,37%	576,50	332.350,80	13,67%	13,67%
44	256,63	65.860,33	6,57%	-6,57%	197,70	39.085,39	5,06%	-5,06%

Metode Penghalusan Eksponensial Tunggal							
Alpha = 0,9				Alpha = 0,8			
MAD	MSE	MAPE	MPE	MAD	MSE	MAPE	MPE
354,19	269.954,62	7,34%	-1,91%	359,08	279.526,23	7,51%	-2,15%
Batas toleransi kesalahan peramalan = 1.018,36				Batas toleransi kesalahan peramalan = 1.036,26			

Sumber: Data sekunder perusahaan yang diolah peneliti

Keterangan : (2), (6) AD = Absolute Deviation = $|Y - Y'|$
(3), (7) SE = Square Error, merupakan Absolute Deviation yang dikuadratkan
(4), (8) APE = Absolute Percentage Error = AD / Y
(5), (9) PE = Percentage Error = error / Y
Jumlah waktu peramalan (n) : Penghalusan Eksponensial Tunggal = 43 bulan



Produk Jamu Pegelinu

Metode Penghalusan Eksponensial Tunggal

waktu	(Y)	smooth (Y') alpha = 0,8	error	smooth (Y') alpha = 0,7	error	
(1)	(2)	(3)	(7)	(4)	(5)	
1	Jan '96	10.058				
2	Feb '96	9.614	10.058,00	(444,00)	10.058,00	(444,00)
3	Mar '96	11.184	9.702,80	1.481,20	9.747,20	1.436,60
4	Apr '96	12.610	10.887,76	1.722,24	10.752,96	1.857,04
5	May '96	14.523	12.265,55	2.257,45	12.052,89	2.470,11
6	Jun '96	14.429	14.071,51	357,49	13.781,97	647,03
7	Jul '96	15.722	14.357,50	1.364,50	14.234,89	1.487,11
8	Aug '96	16.187	15.449,10	737,90	15.275,87	911,13
9	Sep '96	16.590	16.039,42	558,58	15.913,66	684,34
10	Oct '96	18.363	16.486,28	1.876,72	16.392,70	1.970,30
11	Nov '96	19.259	17.987,66	1.271,34	17.771,91	1.487,09
12	Dec '96	16.530	19.004,73	(2.474,73)	18.812,87	(2.282,87)
13	Jan '97	13.186	17.024,95	(3.838,95)	17.214,86	(4.028,86)
14	Feb '97	15.694	13.953,79	1.740,21	14.394,66	1.299,34
15	Mar '97	18.070	15.345,96	2.724,04	15.304,20	2.765,80
16	Apr '97	17.922	17.525,19	396,81	17.240,26	681,74
17	May '97	21.258	17.842,64	3.415,36	17.717,48	3.540,52
18	Jun '97	21.449	20.574,93	874,07	20.195,84	1.253,16
19	Jul '97	20.374	21.274,19	(900,19)	21.073,05	(699,05)
20	Aug '97	21.708	20.554,04	1.153,96	20.563,72	1.124,28
21	Sep '97	20.374	21.477,21	(1.103,21)	21.370,71	(996,71)
22	Oct '97	18.910	20.594,64	(1.684,64)	20.673,01	(1.763,01)
23	Nov '97	15.937	19.246,93	(3.309,93)	19.438,90	(3.501,90)
24	Dec '97	23.281	16.598,99	6.682,01	16.987,57	6.293,43
25	Jan '98	18.887	21.944,60	(3.057,60)	21.392,97	(2.505,97)
26	Feb '98	19.427	19.498,52	(71,52)	19.638,79	(211,79)
27	Mar '98	22.650	19.441,30	3.208,70	19.490,54	3.159,46
28	Apr '98	25.020	22.008,26	3.011,74	21.702,16	3.317,84
29	May '98	26.564	24.417,85	2.146,35	24.024,65	2.539,35
30	Jun '98	27.254	26.134,73	1.119,27	25.802,19	1.451,81
31	Jul '98	28.109	27.030,15	1.078,85	26.818,46	1.290,54
32	Aug '98	28.447	27.893,23	553,77	27.721,84	725,16
33	Sep '98	27.922	28.336,25	(414,25)	28.229,45	(307,45)
34	Oct '98	27.770	28.004,85	(234,85)	28.014,24	(244,24)
35	Nov '98	29.505	27.816,97	1.688,03	27.843,27	1.661,73
36	Dec '98	30.621	29.167,39	1.453,61	29.006,48	1.614,52
37	Jan '99	20.675	30.330,28	(9.655,28)	30.136,64	(9.461,64)
38	Feb '99	25.423	22.606,06	2.816,94	23.513,49	1.909,51
39	Mar '99	26.437	24.859,61	1.577,39	24.850,15	1.586,85
40	Apr '99	29.764	26.121,52	3.642,48	25.960,94	3.803,06
41	May '99	31.087	29.035,50	2.051,50	28.623,08	2.463,92
42	Jun '99	33.064	30.676,70	2.387,30	30.347,82	2.716,18
43	Jul '99	32.965	32.586,54	378,46	32.249,15	715,85
44	Aug '99	36.028	32.889,31	3.138,69	32.750,24	3.277,76
	Sep '99		35.400,26		35.044,67	

Sumber: Data sekunder perusahaan yang dilidih peneliti

Pengukuran Kesalahan Peramalan Metode Penghalusan Eksponensial Tunggal Produk Jamu Pegelino

waktu	Metode Penghalusan Eksponensial Tunggal							
	Alpha = 0,8				Alpha = 0,7			
	AD	SE	APE	PE	AD	SE	APE	PE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1								
2	444,00	197.136,00	4,62%	-4,62%	444,00	197.136,00	4,62%	-4,62%
3	1.481,20	2.193.953,44	13,24%	13,24%	1.436,80	2.064.394,24	12,85%	12,85%
4	1.722,24	2.966.110,62	13,66%	13,66%	1.857,04	3.448.597,56	14,73%	14,73%
5	2.257,45	5.096.071,47	15,54%	15,54%	2.470,11	6.101.453,29	17,01%	17,01%
6	357,49	127.798,81	2,48%	2,48%	647,03	418.652,48	4,48%	4,48%
7	1.364,50	1.861.854,57	8,68%	8,68%	1.487,11	2.211.496,39	9,46%	9,46%
8	737,90	544.495,80	4,56%	4,56%	911,13	830.163,39	5,63%	5,63%
9	558,58	312.011,52	3,37%	3,37%	684,34	468.321,11	4,12%	4,12%
10	1.876,72	3.522.062,88	10,22%	10,22%	1.970,30	3.882.089,86	10,73%	10,73%
11	1.271,34	1.616.313,52	6,60%	6,60%	1.487,09	2.211.438,43	7,72%	7,72%
12	2.474,73	6.124.295,31	14,97%	-14,97%	2.282,87	5.211.508,32	13,81%	-13,81%
13	3.838,95	14.737.508,48	29,11%	-29,11%	4.028,86	16.231.727,78	30,55%	-30,55%
14	1.740,21	3.028.333,44	11,09%	11,09%	1.299,34	1.688.288,19	8,28%	8,28%
15	2.724,04	7.420.405,63	15,07%	15,07%	2.765,80	7.649.663,10	15,31%	15,31%
16	396,81	157.456,93	2,21%	2,21%	681,74	464.770,42	3,80%	3,80%
17	3.415,36	11.664.695,45	16,07%	16,07%	3.540,52	12.535.297,58	16,66%	16,66%
18	874,07	764.002,45	4,08%	4,08%	1.253,16	1.570.401,63	5,84%	5,84%
19	900,19	810.333,99	4,42%	-4,42%	699,05	488.675,10	3,43%	-3,43%
20	1.153,96	1.331.630,36	5,32%	5,32%	1.124,28	1.264.014,74	5,18%	5,18%
21	1.103,21	1.217.066,61	5,41%	-5,41%	996,71	993.440,33	4,89%	-4,89%
22	1.684,64	2.838.016,93	8,91%	-8,91%	1.763,01	3.108.219,88	9,32%	-9,32%
23	3.309,93	10.955.625,33	20,77%	-20,77%	3.501,90	12.263.333,93	21,97%	-21,97%
24	6.682,01	44.649.315,65	28,70%	28,70%	6.293,43	39.607.244,82	27,03%	27,03%
25	3.057,60	9.348.900,22	16,19%	-16,19%	2.505,97	6.279.892,61	13,27%	-13,27%
26	71,52	5.115,03	0,37%	-0,37%	211,79	44.885,60	1,09%	-1,09%
27	3.208,70	10.295.730,76	14,17%	14,17%	3.159,46	9.982.203,76	13,95%	13,95%
28	3.011,74	9.070.573,15	12,04%	12,04%	3.317,84	11.008.054,12	13,26%	13,26%
29	2.146,35	4.606.809,07	8,08%	8,08%	2.539,35	6.448.306,71	9,56%	9,56%
30	1.119,27	1.252.764,37	4,11%	4,11%	1.451,81	2.107.739,18	5,33%	5,33%
31	1.078,85	1.163.925,77	3,84%	3,84%	1.290,54	1.665.497,74	4,59%	4,59%
32	553,77	306.662,08	1,95%	1,95%	725,16	525.860,64	2,55%	2,55%
33	414,25	171.599,62	1,48%	-1,48%	307,45	94.526,27	1,10%	-1,10%
34	234,85	55.154,13	0,85%	-0,85%	244,24	59.650,92	0,88%	-0,88%
35	1.688,03	2.849.445,84	5,72%	5,72%	1.661,73	2.761.344,56	5,63%	5,63%
36	1.453,61	2.112.970,50	4,75%	4,75%	1.614,52	2.606.671,01	5,27%	5,27%
37	9.655,28	93.224.408,58	46,70%	-46,70%	9.461,64	89.522.713,90	45,76%	-45,76%
38	2.816,94	7.935.174,86	11,08%	11,08%	1.909,51	3.646.215,81	7,51%	7,51%
39	1.577,39	2.488.155,58	5,97%	5,97%	1.586,85	2.518.099,30	6,00%	6,00%
40	3.642,48	13.267.644,30	12,24%	12,24%	3.803,06	14.463.231,92	12,78%	12,78%
41	2.051,50	4.208.634,01	6,60%	6,60%	2.463,92	6.070.885,41	7,93%	7,93%
42	2.387,30	5.699.197,04	7,22%	7,22%	2.716,18	7.377.606,65	8,21%	8,21%
43	378,46	143.231,84	1,15%	1,15%	715,85	512.444,80	2,17%	2,17%
44	3.138,69	9.851.387,25	8,71%	8,71%	3.277,76	10.743.682,76	9,10%	9,10%

Metode Penghalusan Eksponensial Tunggal							
Alpha = 0,8				Alpha = 0,7			
MAD	MSE	MAPE	MPE	MAD	MSE	MAPE	MPE
2.001,30	7.027.766,96	9,82%	2,67%	2.060,24	7.054.646,80	10,08%	3,07%
Batas toleransi kesalahan peramalan = 5.195,95				Batas toleransi kesalahan peramalan = 5.205,87			

Sumber: Data sekunder perusahaan yang diolah peneliti

Produk Jamu Gempur Angin

Metode Penghalusan Eksponensial Tunggal

waktu	(Y)	smooth (Y') alpha = 0,9	error	smooth (Y') alpha = 0,8	error	
(1)	(2)	(3)	(4)	(5)	(6)	
1	Jan '96	4.915				
2	Feb '96	5.711	4.915,00	796,00	4.915,00	796,00
3	Mar '96	6.541	5.631,40	909,60	5.551,80	989,20
4	Apr '96	7.299	6.450,04	848,96	6.343,16	955,84
5	May '96	6.638	7.214,10	(576,10)	7.107,83	(469,83)
6	Jun '96	8.314	6.695,61	1.618,39	6.731,97	1.582,03
7	Jul '96	8.353	8.152,16	200,84	7.997,59	355,41
8	Aug '96	9.029	8.332,92	696,08	8.281,92	747,08
9	Sep '96	9.498	8.959,39	538,61	8.879,58	618,42
10	Oct '96	10.518	9.444,14	1.073,86	9.374,32	1.143,68
11	Nov '96	10.026	10.410,61	(384,61)	10.289,26	(263,26)
12	Dec '96	9.129	10.064,46	(335,46)	10.078,65	(949,65)
13	Jan '97	6.900	9.222,55	(2.322,55)	9.318,93	(2.418,93)
14	Feb '97	6.840	7.132,25	(292,25)	7.383,79	(543,79)
15	Mar '97	7.300	6.869,23	430,77	6.948,76	351,24
16	Apr '97	8.289	7.256,92	1.032,08	7.229,75	1.059,25
17	May '97	7.407	8.185,79	(778,79)	8.077,15	(670,15)
18	Jun '97	7.726	7.484,88	241,12	7.541,03	184,97
19	Jul '97	7.209	7.701,89	(492,89)	7.689,01	(480,01)
20	Aug '97	7.173	7.258,29	(65,29)	7.305,00	(132,00)
21	Sep '97	8.289	7.181,53	1.107,47	7.199,40	1.089,60
22	Oct '97	8.978	8.178,25	799,75	8.071,08	906,92
23	Nov '97	9.413	8.898,03	514,97	8.796,62	616,38
24	Dec '97	9.526	9.361,50	164,50	9.289,72	236,28
25	Jan '98	7.555	9.509,55	(1.954,55)	9.478,74	(1.923,74)
26	Feb '98	7.964	7.750,46	213,54	7.939,75	24,25
27	Mar '98	7.263	7.942,65	(679,65)	7.959,15	(696,15)
28	Apr '98	7.919	7.330,96	588,04	7.402,23	516,77
29	May '98	8.254	7.860,20	393,80	7.815,65	438,35
30	Jun '98	9.183	8.214,62	968,38	8.166,33	1.016,67
31	Jul '98	9.771	9.086,16	684,84	8.979,67	791,33
32	Aug '98	9.628	9.702,52	(74,52)	9.612,73	15,27
33	Sep '98	12.648	9.635,45	3.012,55	9.624,95	3.023,05
34	Oct '98	12.109	12.346,75	(237,75)	12.043,39	65,61
35	Nov '98	11.048	12.132,77	(1.084,77)	12.095,88	(1.047,88)
36	Dec '98	10.749	11.156,48	(407,48)	11.257,58	(508,58)
37	Jan '99	8.975	10.789,75	(1.814,75)	10.850,72	(1.875,72)
38	Feb '99	8.476	9.156,47	(680,47)	9.350,14	(874,14)
39	Mar '99	8.165	8.544,05	(379,05)	8.650,83	(485,83)
40	Apr '99	9.153	8.202,90	950,10	8.262,17	890,83
41	May '99	9.387	9.057,99	329,01	8.974,83	412,17
42	Jun '99	8.778	9.354,10	(576,10)	9.304,57	(526,57)
43	Jul '99	9.189	8.835,61	353,39	8.883,31	305,69
44	Aug '99	9.681	9.153,66	527,34	9.127,86	553,14
	Sep '99		9.628,27		9.570,37	

Sumber: Data sekunder perusahaan yang dilah peneliti

Pengukuran Kesalahan Peramalan Metode Penghalusan Eksponensial Tunggal Produk Jamu Gempur Angin

waktu	Metode Penghalusan Eksponensial Tunggal							
	Alpha = 0,9				Alpha = 0,8			
	AD	SE	APE	PE	AD	SE	APE	PE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1								
2	796,00	633.616,00	13,94%	13,94%	796,00	633.616,00	13,94%	13,94%
3	909,60	827.372,16	13,91%	13,91%	989,20	978.516,64	15,12%	15,12%
4	848,96	720.733,08	11,63%	11,63%	955,84	913.630,11	13,10%	13,10%
5	576,10	331.896,82	8,68%	-8,68%	469,83	220.742,11	7,08%	-7,08%
6	1.618,39	2.619.184,90	19,47%	19,47%	1.582,03	2.502.830,31	19,03%	19,03%
7	200,84	40.336,29	2,40%	2,40%	355,41	126.313,94	4,25%	4,25%
8	696,08	484.532,79	7,71%	7,71%	747,08	558.130,53	8,27%	8,27%
9	538,61	290.099,00	5,67%	5,67%	618,42	382.438,68	6,51%	6,51%
10	1.073,86	1.153.177,10	10,21%	10,21%	1.143,68	1.308.011,38	10,87%	10,87%
11	384,61	147.927,86	3,84%	-3,84%	263,26	69.307,59	2,63%	-2,63%
12	935,46	875.088,02	10,25%	-10,25%	949,65	901.840,19	10,40%	-10,40%
13	2.322,55	5.394.220,57	33,66%	-33,66%	2.418,93	5.851.224,93	35,06%	-35,06%
14	292,25	85.412,76	4,27%	-4,27%	543,79	295.703,33	7,95%	-7,95%
15	430,77	185.566,70	5,90%	5,90%	351,24	123.371,49	4,81%	4,81%
16	1.032,08	1.065.183,87	12,45%	12,45%	1.059,25	1.122.007,50	12,78%	12,78%
17	778,79	606.517,38	10,51%	-10,51%	670,15	449.101,41	9,05%	-9,05%
18	241,12	58.139,23	3,12%	3,12%	184,97	34.213,88	2,39%	2,39%
19	492,89	242.938,50	6,84%	-6,84%	480,01	230.405,77	6,66%	-6,66%
20	85,29	7.274,18	1,19%	-1,19%	132,00	17.424,32	1,84%	-1,84%
21	1.107,47	1.226.492,28	13,36%	13,36%	1.089,60	1.187.227,64	13,15%	13,15%
22	799,75	639.595,44	8,91%	8,91%	906,92	822.503,80	10,10%	10,10%
23	514,97	265.198,95	5,47%	5,47%	616,38	379.929,22	6,55%	6,55%
24	164,50	27.059,42	1,73%	1,73%	236,28	55.826,73	2,48%	2,48%
25	1.954,55	3.820.266,69	25,87%	-25,87%	1.923,74	3.700.793,44	25,46%	-25,46%
26	213,54	45.601,46	2,68%	2,68%	24,25	588,11	0,30%	0,30%
27	679,65	461.918,01	9,36%	-9,36%	696,15	484.624,52	9,58%	-9,58%
28	588,04	345.785,69	7,43%	7,43%	516,77	267.051,28	6,53%	6,53%
29	393,80	155.081,23	4,77%	4,77%	438,35	192.154,24	5,31%	5,31%
30	968,38	937.760,51	10,55%	10,55%	1.016,67	1.033.619,52	11,07%	11,07%
31	684,84	469.003,13	7,01%	7,01%	791,33	626.209,75	8,10%	8,10%
32	74,52	5.562,66	0,77%	-0,77%	15,27	233,08	0,16%	0,16%
33	3.012,55	9.075.447,74	23,82%	23,82%	3.023,05	9.138.851,66	23,90%	23,90%
34	237,75	56.522,76	1,96%	-1,96%	65,61	4.304,76	0,54%	0,54%
35	1.084,77	1.176.735,75	9,82%	-9,82%	1.047,89	1.098.048,02	9,48%	-9,48%
36	407,48	166.037,87	3,79%	-3,79%	508,58	258.649,11	4,73%	-4,73%
37	1.814,75	3.293.309,38	20,22%	-20,22%	1.875,72	3.518.307,19	20,90%	-20,90%
38	680,47	463.045,92	8,03%	-8,03%	874,14	764.126,02	10,31%	-10,31%
39	379,05	143.676,99	4,64%	-4,64%	485,83	236.029,43	5,95%	-5,95%
40	950,10	902.680,99	10,38%	10,38%	890,83	793.585,71	9,73%	9,73%
41	329,01	108.247,27	3,50%	3,50%	412,17	169.881,52	4,39%	4,39%
42	576,10	331.890,11	6,56%	-6,56%	526,57	277.272,41	6,00%	-6,00%
43	353,39	124.884,56	3,85%	3,85%	305,69	93.444,34	3,33%	3,33%
44	527,34	278.086,43	5,45%	5,45%	553,14	305.960,91	5,71%	5,71%

Metode Penghalusan Eksponensial Tunggal							
Alpha = 0,9				Alpha = 0,8			
MAD	MSE	MAPE	MPE	MAD	MSE	MAPE	MPE
761,65	936.955,75	8,97%	1,05%	780,27	979.722,15	9,20%	1,15%
Batas toleransi kesalahan peramalan = 1.897,21				Batas toleransi kesalahan peramalan = 1.940,03			

Sumber: Data sekunder perusahaan yang diolah peneliti

LAMPIRAN 4
METODE PERAMALAN AUTOREGRESI
SERTA
PENGUKURAN KESALAHAN PERAMALANNYA



Produk Jamu Galian Singset

1) Metode Autoregresi

waktu		(Y)	lag 1 (X)	(Y')	error	lag 2 (X)	(Y')	error
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Jan '96	6.344						
2	Feb '96	6.511	6.344	6.220,36	290,64			
3	Mar '96	6.539	6.511	6.375,98	163,02	6.344	6.084,55	454,45
4	Apr '96	6.644	6.539	6.402,07	241,93	6.511	6.225,87	418,13
5	May '96	6.779	6.644	6.499,91	279,09	6.539	6.249,56	529,44
6	Jun '96	6.412	6.779	6.625,71	(213,71)	6.644	6.338,41	73,59
7	Jul '96	5.799	6.412	6.283,73	(484,73)	6.779	6.452,65	(653,65)
8	Aug '96	6.262	5.799	5.712,51	549,49	6.412	6.142,10	119,90
9	Sep '96	6.209	6.262	6.143,95	65,05	5.799	5.623,37	585,63
10	Oct '96	5.510	6.209	6.094,56	(584,56)	6.262	6.015,16	(505,16)
11	Nov '96	5.376	5.510	5.443,21	(67,21)	6.209	5.970,32	(594,32)
12	Dec '96	5.750	5.376	5.318,35	431,65	5.510	5.378,82	371,18
13	Jan '97	6.426	5.750	5.666,85	759,15	5.376	5.265,43	1.160,57
14	Feb '97	6.124	6.426	6.296,77	(172,77)	5.750	5.581,91	542,09
15	Mar '97	6.220	6.124	6.015,36	204,64	6.426	6.153,94	66,06
16	Apr '97	7.221	6.220	6.104,82	1.116,18	6.124	5.898,39	1.322,61
17	May '97	6.786	7.221	7.037,58	(251,58)	6.220	5.979,62	806,38
18	Jun '97	6.973	6.786	6.632,23	340,77	7.221	6.826,67	146,33
19	Jul '97	7.401	6.973	6.906,49	494,51	6.786	6.458,58	942,42
20	Aug '97	7.300	7.401	7.205,31	94,69	6.973	6.616,82	683,18
21	Sep '97	7.464	7.300	7.111,20	352,80	7.401	6.978,99	485,01
22	Oct '97	6.041	7.464	7.264,02	(1.223,02)	7.300	6.893,52	(852,52)
23	Nov '97	5.871	6.041	5.938,02	(67,02)	7.464	7.032,30	(1.161,30)
24	Dec '97	5.739	5.871	5.779,60	(40,60)	6.041	5.828,15	(89,15)
25	Jan '98	5.889	5.739	5.656,60	232,40	5.871	5.684,30	204,70
26	Feb '98	5.243	5.889	5.796,38	(553,38)	5.739	5.572,60	(329,60)
27	Mar '98	3.236	5.243	5.194,41	(1.958,41)	5.889	5.699,53	(2.463,53)
28	Apr '98	3.293	3.236	3.324,22	(31,22)	5.243	5.152,88	(1.859,88)
29	May '98	3.596	3.293	3.377,33	218,67	3.236	3.454,55	141,45
30	Jun '98	3.770	3.596	3.659,68	110,32	3.293	3.502,78	267,22
31	Jul '98	3.786	3.770	3.821,82	(35,82)	3.596	3.759,18	26,82
32	Aug '98	3.878	3.786	3.836,73	41,27	3.770	3.906,42	(28,42)
33	Sep '98	4.369	3.878	3.922,46	446,54	3.786	3.919,96	449,04
34	Oct '98	4.216	4.369	4.379,99	(163,99)	3.878	3.997,81	218,19
35	Nov '98	4.424	4.216	4.237,42	186,58	4.369	4.413,30	10,70
36	Dec '98	4.639	4.424	4.431,24	207,76	4.216	4.283,83	355,17
37	Jan '99	4.186	4.639	4.631,58	(445,58)	4.424	4.459,84	(273,84)
38	Feb '99	3.800	4.186	4.209,46	(409,46)	4.639	4.641,78	(841,78)
39	Mar '99	3.735	3.800	3.849,77	(114,77)	4.186	4.258,44	(523,44)
40	Apr '99	3.389	3.735	3.789,20	(400,20)	3.800	3.931,81	(542,81)
41	May '99	3.562	3.389	3.466,79	95,21	3.735	3.876,81	(314,81)
42	Jun '99	3.665	3.562	3.628,00	37,00	3.389	3.584,02	80,98
43	Jul '99	4.217	3.665	3.723,98	493,02	3.562	3.730,41	486,59
44	Aug '99	3.904	4.217	4.238,35	(334,35)	3.665	3.817,57	86,43
	Sep '99		3.904	3.946,68		4.217	4.284,68	

Sumber: Data sekunder perusahaan yang diolah peneliti

Keterangan :

(3) Y = Data aktual = data realisasi penjualan

(4), (7) $X = Y(t-n)$ = Lag n , merupakan variabel data aktual yang dimundurkan n periode

(5), (8) Y' = merupakan data peramalan diperoleh dengan rumus $Y' = b_0 + bX$
dimana koefisien b_0 dan b dapat dilihat pada tabel 2)

(6), (9) $error = Y - Y'$ = Kesalahan peramalan = kolom (3) - kolom (5)
Kesalahan peramalan = kolom (3) - kolom (8)



2) Tabel Perhitungan Koefisien b_0 dan b Metode Autoregresi

waktu	Autoregresi order 1				Autoregresi order 2			
	(Y)	(X)	X kuadrat	XY	(Y)	(X)	X kuadrat	XY
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1								
2	6.511	6.344	40.246.336	41.305.784				
3	6.539	6.511	42.393.121	42.575.429	6.539	6.344	40.246.336	41.489.416
4	6.644	6.539	42.758.521	43.445.116	6.644	6.511	42.393.121	43.259.084
5	6.779	6.644	44.142.736	45.039.676	6.779	6.539	42.758.521	44.327.881
6	6.412	6.779	45.954.841	43.466.948	6.412	6.644	44.142.736	42.601.328
7	5.799	6.412	41.113.744	37.183.188	5.799	6.779	45.954.841	39.311.421
8	6.262	5.799	39.628.401	36.313.338	6.262	6.412	41.113.744	40.151.944
9	6.209	6.262	39.212.644	38.880.758	6.209	5.799	33.628.401	36.005.991
10	5.510	6.209	38.551.681	34.211.590	5.510	6.262	39.212.644	34.503.620
11	5.376	5.510	30.360.100	29.621.760	5.376	6.209	38.551.681	33.379.584
12	5.750	5.376	28.901.376	30.912.000	5.750	5.510	30.360.100	31.682.500
13	6.426	5.750	33.062.500	36.949.500	6.426	5.376	28.901.376	34.546.176
14	6.124	6.426	41.293.476	39.352.824	6.124	5.750	33.062.500	35.213.000
15	6.220	6.124	37.503.376	38.091.280	6.220	6.426	41.293.476	39.969.720
16	7.221	6.220	38.688.400	44.914.620	7.221	6.124	37.503.376	44.221.404
17	6.786	7.221	52.142.841	49.001.706	6.786	6.220	38.688.400	42.208.920
18	6.973	6.786	46.049.796	47.318.778	6.973	7.221	52.142.841	50.352.033
19	7.401	6.973	48.622.729	51.607.173	7.401	6.786	46.049.796	50.223.186
20	7.300	7.401	54.774.801	54.027.300	7.300	6.973	48.622.729	50.902.900
21	7.464	7.300	53.290.000	54.487.200	7.464	7.401	54.774.801	55.241.064
22	6.041	7.464	55.711.296	45.090.024	6.041	7.300	53.290.000	44.099.300
23	5.871	6.041	36.493.681	35.466.711	5.871	7.464	55.711.296	43.821.144
24	5.739	5.871	34.468.641	33.693.669	5.739	6.041	36.493.681	34.669.299
25	5.889	5.739	32.936.121	33.796.971	5.889	5.871	34.468.641	34.574.319
26	5.243	5.889	34.680.321	30.876.027	5.243	5.739	32.936.121	30.089.577
27	3.236	5.243	27.489.049	16.966.348	3.236	5.889	34.680.321	19.056.804
28	3.293	3.236	10.471.696	10.656.148	3.293	5.243	27.489.049	17.265.199
29	3.596	3.293	10.843.849	11.841.628	3.596	3.236	10.471.696	11.636.656
30	3.770	3.596	12.931.216	13.556.920	3.770	3.293	10.843.849	12.414.610
31	3.786	3.770	14.212.900	14.273.220	3.786	3.596	12.931.216	13.614.456
32	3.878	3.786	14.333.796	14.682.108	3.878	3.770	14.212.900	14.620.060
33	4.369	3.878	15.038.884	16.942.982	4.369	3.786	14.333.796	16.541.034
34	4.216	4.369	19.088.161	18.419.704	4.216	3.878	15.038.884	16.349.648
35	4.424	4.216	17.774.656	18.651.584	4.424	4.369	19.088.161	19.328.456
36	4.639	4.424	19.571.776	20.522.936	4.639	4.216	17.774.656	19.558.024
37	4.186	4.639	21.520.321	19.418.854	4.186	4.424	19.571.776	18.518.664
38	3.800	4.186	17.522.596	15.906.800	3.800	4.639	21.520.321	17.628.200
39	3.735	3.800	14.440.000	14.193.000	3.735	4.186	17.522.596	15.634.710
40	3.389	3.735	13.950.225	12.657.915	3.389	3.800	14.440.000	12.878.200
41	3.562	3.389	11.485.321	12.071.618	3.562	3.735	13.950.225	13.304.070
42	3.665	3.562	12.687.844	13.054.730	3.665	3.389	11.485.321	12.420.685
43	4.217	3.665	13.432.225	15.455.305	4.217	3.562	12.687.844	15.020.954
44	3.904	4.217	17.783.089	16.463.168	3.904	3.665	13.432.225	14.308.160
Jumlah	228.154	230.594	1.311.569.084	1.293.364.338	221.643	226.377	1.293.775.995	1.256.937.601
	$b =$	0,93			$b =$	0,85		
	$b_0 =$	308,80			$b_0 =$	716,23		

Sumber: Data sekunder perusahaan yang diolah peneliti

Pengukuran Kesalahan Peramalan Metode Autoregresi Produk Jamu Galian Singset

waktu	Autoregresi order 1				Autoregresi order 2			
	AD	SE	APE	PE	AD	SE	APE	PE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1								
2	290,64	84.470,06	4,46%	4,46%				
3	163,02	26.575,79	2,49%	2,49%	454,45	206.521,64	6,95%	6,95%
4	241,93	58.529,84	3,64%	3,64%	418,13	174.833,06	6,29%	6,29%
5	279,09	77.889,38	4,12%	4,12%	529,44	280.303,24	7,81%	7,81%
6	213,71	45.672,43	3,33%	-3,33%	73,59	5.414,79	1,15%	1,15%
7	484,73	234.960,72	8,36%	-8,36%	653,65	427.261,30	11,27%	-11,27%
8	549,49	301.936,72	8,77%	8,77%	119,90	14.377,12	1,91%	1,91%
9	65,05	4.231,22	1,05%	1,05%	585,63	342.959,90	9,43%	9,43%
10	584,56	341.716,08	10,61%	-10,61%	505,16	255.191,41	9,17%	-9,17%
11	67,21	4.517,43	1,25%	-1,25%	594,32	353.211,41	11,05%	-11,05%
12	431,65	186.325,26	7,51%	7,51%	371,18	137.775,17	6,46%	6,46%
13	759,15	576.305,12	11,81%	11,81%	1.160,57	1.346.927,67	18,06%	18,06%
14	172,77	29.850,57	2,82%	-2,82%	542,09	293.663,50	8,85%	8,85%
15	204,64	41.878,00	3,29%	3,29%	66,06	4.363,63	1,06%	1,06%
16	1.116,18	1.245.868,83	15,46%	15,46%	1.322,61	1.749.301,01	18,32%	18,32%
17	251,58	63.293,70	3,71%	-3,71%	806,38	650.241,99	11,88%	11,88%
18	340,77	116.121,50	4,89%	4,89%	146,33	21.411,15	2,10%	2,10%
19	594,51	353.445,49	8,03%	8,03%	942,42	888.163,55	12,73%	12,73%
20	94,69	8.965,67	1,30%	1,30%	683,18	466.740,54	9,36%	9,36%
21	352,80	124.469,68	4,73%	4,73%	485,01	235.233,49	6,50%	6,50%
22	1.223,02	1.495.774,04	20,25%	-20,25%	852,52	726.798,25	14,11%	-14,11%
23	67,02	4.491,21	1,14%	-1,14%	1.161,30	1.348.622,59	19,78%	-19,78%
24	40,60	1.648,72	0,71%	-0,71%	89,15	7.948,37	1,55%	-1,55%
25	232,40	54.008,75	3,95%	3,95%	204,70	41.902,53	3,48%	3,48%
26	553,38	306.226,66	10,55%	-10,55%	329,60	108.636,14	6,29%	-6,29%
27	1.958,41	3.835.376,68	60,52%	-60,52%	2.463,53	6.068.982,99	76,13%	-76,13%
28	31,22	974,56	0,95%	-0,95%	1.859,88	3.459.163,73	56,48%	-56,48%
29	218,67	47.815,45	6,08%	6,08%	141,45	20.007,81	3,93%	3,93%
30	110,32	12.170,79	2,93%	2,93%	267,22	71.404,04	7,09%	7,09%
31	35,82	1.282,94	0,95%	-0,95%	26,82	719,07	0,71%	0,71%
32	41,27	1.703,42	1,06%	1,06%	28,42	807,93	0,73%	-0,73%
33	446,54	199.401,25	10,22%	10,22%	449,04	201.633,96	10,28%	10,28%
34	163,99	26.891,92	3,89%	-3,89%	218,19	47.605,10	5,18%	5,18%
35	186,58	34.813,32	4,22%	4,22%	10,70	114,48	0,24%	0,24%
36	207,76	43.164,84	4,48%	4,48%	355,17	126.144,97	7,66%	7,66%
37	445,58	198.544,33	10,64%	-10,64%	273,84	74.989,18	6,54%	-6,54%
38	409,46	167.658,85	10,78%	-10,78%	841,78	708.585,86	22,15%	-22,15%
39	114,77	13.172,88	3,07%	-3,07%	523,44	273.994,61	14,01%	-14,01%
40	400,20	160.163,12	11,81%	-11,81%	542,81	294.642,86	16,02%	-16,02%
41	95,21	9.065,18	2,67%	2,67%	314,81	99.103,37	8,84%	-8,84%
42	37,00	1.369,27	1,01%	1,01%	80,98	6.557,72	2,21%	2,21%
43	493,02	243.073,29	11,69%	11,69%	486,59	236.766,36	11,54%	11,54%
44	334,35	111.788,96	8,56%	-8,56%	86,43	7.469,70	2,21%	2,21%

Autoregresi order 1				Autoregresi order 2			
MAD	MSE	MAPE	MPE	MAD	MSE	MAPE	MPE
351,27	253.432,65	7,06%	-1,02%	525,44	518.730,89	10,89%	-2,16%
Batas toleransi kesalahan peramalan = 986,71				Batas toleransi kesalahan peramalan = 1.411,65			

Sumber: Data sekunder perusahaan yang diolah peneliti

Keterangan :

(2), (5) AD = Absolute Deviation = $|Y - Y^*|$, merupakan error yang diabsolutkan

(3), (7) SE = Square Error, merupakan error yang dikuadratkan

(4), (8) APE = Absolute Percentage Error = AD / Y

(5), (9) PE = Percentage Error = $error / Y$

Jumlah waktu parameter (n) : Autoregresi order 1 = 43 bulan, Autoregresi order 2 = 42 bulan



Produk Jamu Pegelinu

1) Metode Autoregresi

waktu		(Y)	lag 1 (X)	(Y')	error	lag 2 (X)	(Y')	error
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Jan '96	10.050						
2	Feb '96	9.614	10.050	11.391,55	(1.777,55)			
3	Mar '96	11.184	9.614	10.984,17	199,83	10.050	12.501,30	(1.317,30)
4	Apr '96	12.610	11.184	12.451,09	158,91	9.614	12.116,13	493,87
5	May '96	14.523	12.610	13.783,46	739,54	11.184	13.503,10	1.019,90
6	Jun '96	14.429	14.523	15.570,85	(1.141,85)	12.610	14.762,87	(333,87)
7	Jul '96	15.722	14.429	15.483,02	238,98	14.523	16.452,86	(730,86)
8	Aug '96	16.187	15.722	16.691,13	(504,13)	14.429	16.369,82	(182,82)
9	Sep '96	16.598	16.187	17.125,59	(527,59)	15.722	17.512,08	(914,08)
10	Oct '96	18.363	16.598	17.509,61	853,39	16.187	17.922,88	440,12
11	Nov '96	19.259	18.363	19.158,72	100,28	16.598	18.285,96	973,04
12	Dec '96	16.530	19.259	19.995,89	(3.465,89)	18.363	19.845,21	(3.315,21)
13	Jan '97	13.186	16.530	17.446,07	(4.260,07)	19.259	20.636,76	(7.450,76)
14	Feb '97	15.694	13.186	14.321,64	1.372,36	16.530	18.225,89	(2.531,89)
15	Mar '97	18.070	15.694	16.664,96	1.405,04	13.186	15.271,72	2.798,28
16	Apr '97	17.922	18.070	18.894,96	(962,96)	15.694	17.487,35	434,65
17	May '97	21.258	17.922	18.746,67	2.511,33	18.070	19.586,37	1.671,63
18	Jun '97	21.449	21.258	21.863,63	(414,63)	17.922	19.455,62	1.993,38
19	Jul '97	20.624	21.449	22.042,09	(1.418,09)	21.258	22.402,72	(1.778,72)
20	Aug '97	21.708	20.624	21.271,26	436,74	21.449	22.571,46	(863,46)
21	Sep '97	20.374	21.708	22.284,09	(1.910,09)	20.624	21.842,63	(1.468,63)
22	Oct '97	18.910	20.374	21.037,68	(2.127,68)	21.708	22.800,26	(3.890,26)
23	Nov '97	15.937	18.910	19.669,80	(3.732,80)	20.374	21.621,78	(5.684,78)
24	Dec '97	23.281	15.937	16.892,01	6.388,99	18.910	20.328,44	2.952,56
25	Jan '98	18.887	23.281	23.753,81	(4.866,81)	15.937	17.702,02	1.184,98
26	Feb '98	19.427	18.887	19.648,31	(221,31)	23.281	24.189,89	(4.762,89)
27	Mar '98	22.650	19.427	20.152,86	2.497,14	18.887	20.308,12	2.341,88
28	Apr '98	25.020	22.650	23.164,24	1.856,76	19.427	20.785,17	4.234,83
29	May '98	26.564	25.020	25.378,62	1.185,38	22.650	23.632,45	2.931,55
30	Jun '98	27.254	26.564	26.821,25	432,75	25.020	25.726,17	1.527,83
31	Jul '98	28.109	27.254	27.465,94	643,06	26.564	27.090,18	1.018,82
32	Aug '98	28.447	28.109	28.264,80	182,20	27.254	27.699,74	747,26
33	Sep '98	27.922	28.447	28.580,61	(658,61)	28.109	28.455,07	(533,07)
34	Oct '98	27.770	27.922	28.090,08	(320,08)	28.447	28.753,66	(983,66)
35	Nov '98	29.505	27.770	27.948,06	1.556,94	27.922	28.289,87	1.215,13
36	Dec '98	30.621	29.505	29.569,14	1.051,86	27.770	28.155,59	2.465,41
37	Jan '99	20.675	30.621	30.611,87	(9.936,87)	29.505	29.688,33	(9.013,33)
38	Feb '99	25.423	20.675	21.318,91	4.104,09	30.621	30.674,23	(5.251,23)
39	Mar '99	26.437	25.423	25.755,16	681,84	20.675	21.887,69	4.549,31
40	Apr '99	29.764	26.437	26.702,58	3.061,42	25.423	26.082,19	3.681,81
41	May '99	31.087	29.764	29.811,14	1.275,86	26.437	26.977,98	4.109,02
42	Jun '99	33.064	31.087	31.047,27	2.016,73	29.764	29.917,13	3.146,87
43	Jul '99	32.965	33.064	32.894,46	70,54	31.087	31.085,91	1.879,09
44	Aug '99	36.028	32.965	32.801,96	3.226,04	33.064	32.832,44	3.195,56
	Sep '99		36.028	35.663,84		32.965	32.744,98	

Sumber: Data sekunder perusahaan yang diolah peneliti

2) Tabel Perhitungan Koefisien b dan b0 Metode Autoregresi

waktu	Autoregresi order 1				Autoregresi order 2			
	(Y)	(X)	X kuadrat	XY	(Y)	(X)	X kuadrat	XY
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1								
2	9.614	10.050	101.002.500	96.620.700				
3	11.184	9.614	92.428.996	107.522.976	11.184	10.050	101.002.500	112.399.200
4	12.610	11.184	125.081.856	141.030.240	12.610	9.614	92.428.996	121.232.540
5	14.523	12.610	159.012.100	183.135.030	14.523	11.184	125.081.856	162.425.232
6	14.429	14.523	210.917.529	209.552.367	14.429	12.610	159.012.100	181.949.690
7	15.722	14.429	208.196.041	226.852.738	15.722	14.523	210.917.529	228.330.606
8	16.187	15.722	247.181.284	254.492.014	16.187	14.429	208.196.041	233.562.223
9	16.598	16.187	262.018.969	268.671.826	16.598	15.722	247.181.284	260.953.756
10	18.363	16.598	275.493.604	304.789.074	18.363	16.187	262.018.969	297.241.881
11	19.259	18.363	337.199.769	353.653.017	19.259	16.598	275.493.604	319.660.882
12	16.530	19.259	370.909.081	318.351.270	16.530	18.363	337.199.769	303.540.390
13	13.186	16.530	273.240.900	217.964.580	13.186	19.259	370.909.081	253.949.174
14	15.694	13.186	173.870.596	206.941.084	15.694	16.530	273.240.900	259.421.820
15	18.070	15.694	246.301.636	283.590.580	18.070	13.186	173.870.596	238.271.020
16	17.922	18.070	326.524.900	323.850.540	17.922	15.694	246.301.636	281.267.868
17	21.258	17.922	321.198.084	380.965.876	21.258	18.070	326.524.900	384.132.060
18	21.449	21.258	451.902.564	455.962.842	21.449	17.922	321.198.084	384.408.978
19	20.624	21.449	460.059.601	442.364.176	20.624	21.258	451.902.564	438.424.992
20	21.708	20.624	425.349.376	447.705.792	21.708	21.449	460.059.601	465.614.892
21	20.374	21.708	471.237.264	442.278.792	20.374	20.624	425.349.376	420.193.376
22	18.910	20.374	415.099.876	385.272.340	18.910	21.708	471.237.264	410.498.280
23	15.937	18.910	357.588.100	301.368.670	15.937	20.374	415.099.876	324.700.438
24	23.281	15.937	253.987.969	371.029.297	23.281	18.910	357.588.100	440.243.710
25	18.887	23.281	542.004.961	439.708.247	18.887	15.937	253.987.969	301.002.119
26	19.427	18.887	356.718.769	366.917.749	19.427	23.281	542.004.961	452.279.987
27	22.650	19.427	377.408.329	440.021.550	22.650	18.887	356.718.769	427.790.550
28	25.020	22.650	513.022.500	566.703.000	25.020	19.427	377.408.329	486.063.540
29	26.564	25.020	626.000.400	664.631.280	26.564	22.650	513.022.500	601.674.600
30	27.254	26.564	705.646.096	723.975.256	27.254	25.020	626.000.400	681.895.080
31	28.109	27.254	742.780.516	766.082.686	28.109	26.564	705.646.096	746.687.476
32	28.447	28.109	790.115.881	799.616.723	28.447	27.254	742.780.516	775.294.538
33	27.922	28.447	809.231.809	794.297.134	27.922	28.109	790.115.881	784.859.498
34	27.770	27.922	779.638.084	775.393.940	27.770	28.447	809.231.809	789.973.190
35	29.505	27.770	771.172.900	819.353.850	29.505	27.922	779.638.084	823.838.610
36	30.621	29.505	870.545.025	903.472.605	30.621	27.770	771.172.900	850.345.170
37	20.675	30.621	937.645.641	633.089.175	20.675	29.505	870.545.025	610.015.875
38	25.423	20.675	427.455.625	525.620.525	25.423	30.621	937.645.641	778.477.683
39	26.437	25.423	646.328.929	672.107.851	26.437	20.675	427.455.625	546.584.975
40	29.764	26.437	698.914.969	786.870.868	29.764	25.423	646.328.929	756.690.172
41	31.087	29.764	885.895.696	925.273.468	31.087	26.437	698.914.969	821.847.019
42	33.064	31.087	966.401.569	1.027.860.568	33.064	29.764	885.895.696	984.116.896
43	32.965	33.064	1.093.228.096	1.089.954.760	32.965	31.087	966.401.569	1.024.782.955
44	36.028	32.965	1.086.691.225	1.187.663.020	36.028	33.064	1.093.228.096	1.191.229.792
Jumlah	941.051	915.073	21.192.649.615	21.632.600.076	931.437	882.108	20.105.958.390	20.957.872.733
	b =	0,99			b =	0,89		
	b0 =	2.001,42			b0 =	3.622,88		

Sumber: Data sekunder perusahaan yang diolah peneliti

Pengukuran Kesalahan Peramalan Metode Autoregresi Produk Jamu Pegelinu

waktu	Autoregresi order 1				Autoregresi order 2			
	AD	SE	APE	PE	AD	SE	APE	PE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1								
2	1.777,55	3.159.667,92	18,49%	-18,49%				
3	199,83	39.930,83	1,79%	1,79%	1.317,30	1.735.275,55	11,78%	-11,78%
4	158,91	25.253,13	1,26%	1,26%	493,87	243.912,14	3,92%	3,92%
5	739,54	546.923,40	5,09%	5,09%	1.019,90	1.040.191,39	7,02%	7,02%
6	1.141,85	1.303.623,22	7,91%	-7,91%	333,87	111.466,49	2,31%	-2,31%
7	238,98	57.110,12	1,52%	1,52%	730,86	534.152,77	4,65%	-4,65%
8	504,13	254.142,13	-3,11%	-3,11%	182,82	33.421,55	1,13%	-1,13%
9	527,59	278.354,87	3,18%	-3,18%	914,08	635.549,29	5,51%	-5,51%
10	853,39	728.278,86	4,65%	4,65%	440,12	193.708,81	2,40%	2,40%
11	100,28	10.056,37	0,52%	0,52%	973,04	946.799,16	5,05%	5,05%
12	3.465,89	12.012.377,27	20,97%	-20,97%	3.315,21	10.990.608,45	20,06%	-20,06%
13	4.260,07	18.148.215,85	32,31%	-32,31%	7.450,76	55.513.783,57	56,51%	-56,51%
14	1.372,36	1.883.378,94	8,74%	8,74%	2.531,89	6.410.472,35	16,13%	-16,13%
15	1.405,04	1.974.127,35	7,78%	7,78%	2.798,28	7.630.378,53	15,49%	15,49%
16	962,96	927.285,68	5,37%	-5,37%	434,65	188.922,40	2,43%	2,43%
17	2.511,33	6.306.756,59	11,81%	11,81%	1.671,63	2.794.362,90	7,86%	7,86%
18	414,63	171.921,71	1,93%	-1,93%	1.993,38	3.973.570,46	9,29%	9,29%
19	1.418,09	2.010.989,11	6,88%	-6,88%	1.778,72	3.163.856,77	8,62%	-8,62%
20	436,74	190.739,63	2,01%	2,01%	863,46	745.558,83	3,98%	-3,98%
21	1.910,09	3.648.434,96	9,38%	-9,38%	1.468,63	2.156.880,11	7,21%	-7,21%
22	2.127,68	4.527.011,04	11,25%	-11,25%	3.890,26	15.134.157,87	20,57%	-20,57%
23	3.732,80	13.933.816,79	23,42%	-23,42%	5.684,78	32.316.676,60	35,67%	-35,67%
24	6.388,99	40.819.214,53	27,44%	27,44%	2.952,56	8.717.598,71	12,68%	12,68%
25	4.866,81	23.685.794,59	25,77%	-25,77%	1.184,98	1.404.177,18	6,27%	6,27%
26	221,31	48.979,43	1,14%	-1,14%	4.762,89	22.685.136,92	24,52%	-24,52%
27	2.497,14	6.235.723,79	11,02%	11,02%	2.341,88	5.484.386,78	10,34%	10,34%
28	1.855,76	3.443.858,22	7,42%	7,42%	4.234,83	17.933.763,03	16,93%	16,93%
29	1.185,38	1.405.117,20	4,46%	4,46%	2.931,55	8.593.981,72	11,04%	11,04%
30	432,75	187.276,52	1,59%	1,59%	1.527,83	2.334.272,69	5,61%	5,61%
31	643,06	413.525,64	2,29%	2,29%	1.018,82	1.038.004,05	3,62%	3,62%
32	182,20	33.196,26	0,64%	0,64%	747,26	558.400,12	2,63%	2,63%
33	658,61	433.765,41	2,36%	-2,36%	533,07	284.159,81	1,91%	-1,91%
34	320,88	102.451,14	1,15%	-1,15%	983,66	967.594,85	3,54%	-3,54%
35	1.556,94	2.424.061,74	5,28%	5,28%	1.215,13	1.476.550,66	4,12%	4,12%
36	1.051,86	1.106.407,35	3,44%	3,44%	2.465,41	6.078.269,01	8,05%	8,05%
37	9.936,87	98.741.287,25	48,06%	-48,06%	9.013,33	81.240.070,75	43,60%	-43,60%
38	4.104,09	16.843.522,81	16,14%	16,14%	5.251,23	27.575.410,57	20,66%	-20,66%
39	681,84	464.901,90	2,58%	2,58%	4.549,31	20.696.251,36	17,21%	17,21%
40	3.061,42	9.372.266,86	10,29%	10,29%	3.681,81	13.555.743,26	12,37%	12,37%
41	1.275,86	1.627.830,98	4,10%	4,10%	4.109,02	16.884.043,59	13,22%	13,22%
42	2.016,73	4.067.208,92	6,10%	6,10%	3.146,87	9.902.763,04	9,52%	9,52%
43	70,54	4.976,03	0,21%	0,21%	1.879,09	3.530.996,61	5,70%	5,70%
44	3.226,04	10.407.338,43	8,95%	8,95%	3.195,56	10.211.628,40	8,87%	8,87%

Autoregresi order 1				Autoregresi order 2			
MAD	MSE	MAPE	MPE	MAD	MSE	MAPE	MPE
1.778,93	6.637.379,09	8,83%	-1,52%	2.428,90	9.715.402,60	11,67%	-2,06%
Batas toleransi kesalahan peramalan = 5.125,08				Batas toleransi Kesalahan peramalan = 6109,23			

Sumber: Data sekunder perusahaan yang diolah peneliti

Produk Jamu Gempur Angin

1) Metode Autoregresi

waktu		(Y)	lag 1 (X)	(Y')	error	lag 2 (X)	(Y')	error
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Jan '96	4.915						
2	Feb '96	5.711	4.915	5.936,57	(225,57)			
3	Mar '96	6.541	5.711	6.532,61	8,39	4.915	6.915,02	(374,02)
4	Apr '96	7.299	6.541	7.154,10	144,90	5.711	7.313,29	(14,29)
5	May '96	6.638	7.299	7.721,68	(1.083,68)	6.541	7.728,57	(1.090,57)
6	Jun '96	8.314	6.638	7.226,73	1.087,27	7.299	8.107,83	206,17
7	Jul '96	8.353	8.314	8.481,70	(128,70)	6.638	7.777,10	575,90
8	Aug '96	9.029	8.353	8.510,90	518,10	8.314	8.615,67	413,33
9	Sep '96	9.498	9.029	9.017,08	480,92	8.353	8.635,18	862,82
10	Oct '96	10.518	9.498	9.368,26	1.149,74	9.029	8.973,41	1.544,59
11	Nov '96	10.026	10.518	10.132,03	(106,03)	9.498	9.208,07	817,93
12	Dec '96	9.129	10.026	9.763,62	(634,62)	10.518	9.718,41	(589,41)
13	Jan '97	6.900	9.129	9.091,96	(2.191,96)	10.026	9.472,24	(2.572,24)
14	Feb '97	6.840	6.900	7.422,91	(582,91)	9.129	9.023,44	(2.183,44)
15	Mar '97	7.300	6.840	7.377,99	(77,99)	6.900	7.908,19	(608,19)
16	Apr '97	8.289	7.300	7.722,43	566,57	6.840	7.878,17	410,83
17	May '97	7.407	8.289	8.462,98	(1.055,98)	7.300	8.108,33	(701,33)
18	Jun '97	7.726	7.407	7.802,55	(76,55)	8.289	8.603,16	(877,16)
19	Jul '97	7.209	7.726	8.041,41	(832,41)	7.407	8.161,86	(952,86)
20	Aug '97	7.173	7.209	7.654,29	(481,29)	7.726	8.321,47	(1.148,47)
21	Sep '97	8.289	7.173	7.627,33	661,67	7.209	8.062,79	226,21
22	Oct '97	8.978	8.289	8.462,98	515,02	7.173	8.044,78	933,22
23	Nov '97	9.413	8.978	8.978,89	434,11	8.289	8.603,16	809,84
24	Dec '97	9.526	9.413	9.304,62	221,38	8.978	8.947,89	578,11
25	Jan '98	7.555	9.526	9.389,23	(1.834,23)	9.413	9.165,54	(1.610,54)
26	Feb '98	7.964	7.555	7.913,37	50,63	9.526	9.222,08	(1.258,08)
27	Mar '98	7.263	7.964	8.219,62	(956,62)	7.555	8.235,91	(972,91)
28	Apr '98	7.919	7.263	7.694,72	224,28	7.964	8.440,55	(521,55)
29	May '98	8.254	7.919	8.185,93	68,07	7.263	8.089,81	164,19
30	Jun '98	9.183	8.254	8.436,77	746,23	7.919	8.418,03	764,97
31	Jul '98	9.771	9.183	9.132,40	638,60	8.254	8.585,65	1.185,35
32	Aug '98	9.628	9.771	9.572,68	55,32	9.183	9.050,46	577,54
33	Sep '98	12.648	9.628	9.465,61	3.182,39	9.771	9.344,66	3.303,34
34	Oct '98	12.109	12.648	11.726,94	382,06	9.628	9.273,11	2.835,89
35	Nov '98	11.048	12.109	11.323,35	(275,35)	12.648	10.784,13	263,87
36	Dec '98	10.749	11.048	10.528,88	220,12	12.109	10.514,45	234,55
37	Jan '99	8.975	10.749	10.305,00	(1.330,00)	11.048	9.983,59	(1.008,59)
38	Feb '99	8.476	8.975	8.976,65	(500,65)	10.749	9.833,99	(1.357,99)
39	Mar '99	8.165	8.476	8.603,00	(438,00)	8.975	8.946,39	(781,39)
40	Apr '99	9.153	8.165	8.370,13	782,87	8.476	8.696,72	456,28
41	May '99	9.387	9.153	9.109,93	277,07	8.165	8.541,12	845,88
42	Jun '99	8.778	9.387	9.285,15	(507,15)	9.153	9.035,45	(257,45)
43	Jul '99	9.189	8.778	8.829,14	359,86	9.387	9.152,53	36,47
44	Aug '99	9.681	9.189	9.136,89	544,11	8.778	8.847,82	833,18
	Sep '99		9.681	9.505,29		9.189	9.053,46	

Sumber: Data sekunder perusahaan yang diolah peneliti

2) Tabel Perhitungan Koefisien b dan b0 Metode Autoregresi

waktu	Autoregresi order 1				Autoregresi order 2			
	(Y)	(X)	X kuadrat	XY	(Y)	(X)	X kuadrat	XY
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1								
2	5.711	4.915	24.157.225	28.069.565				
3	6.541	5.711	32.615.521	37.355.651	6.541	4.915	24.157.225	32.149.015
4	7.299	6.541	42.784.681	47.742.759	7.299	5.711	32.615.521	41.684.589
5	6.638	7.299	53.275.401	48.450.762	6.638	6.541	42.784.681	43.419.158
6	8.314	6.638	44.063.044	55.188.332	8.314	7.299	53.275.401	60.683.886
7	8.353	8.314	69.122.596	69.446.842	8.353	6.638	44.063.044	55.447.214
8	9.029	8.353	69.772.609	75.419.237	9.029	8.314	69.122.596	75.067.106
9	9.498	9.029	81.522.841	85.757.442	9.498	8.353	69.772.609	79.336.794
10	10.518	9.498	90.212.004	99.899.964	10.518	9.029	81.522.841	94.967.022
11	10.026	10.518	110.628.324	105.453.468	10.026	9.498	90.212.004	95.226.948
12	9.129	10.026	100.520.676	91.527.354	9.129	10.518	110.628.324	96.018.822
13	6.900	9.129	83.338.641	62.990.100	6.900	10.026	100.520.676	69.179.400
14	6.840	6.900	47.610.000	47.196.000	6.840	9.129	83.338.641	62.442.360
15	7.300	6.840	46.785.600	49.932.000	7.300	6.900	47.610.000	50.370.000
16	8.289	7.300	53.290.000	60.509.700	8.289	6.840	46.785.600	56.696.760
17	7.407	8.289	68.707.521	61.396.623	7.407	7.300	53.290.000	54.071.100
18	7.726	7.407	54.863.649	57.226.482	7.726	8.289	68.707.521	64.040.814
19	7.209	7.726	59.691.076	55.696.734	7.209	7.407	54.863.649	53.397.063
20	7.173	7.209	51.969.681	51.710.157	7.173	7.726	59.691.076	55.418.598
21	8.289	7.173	51.451.929	59.456.997	8.289	7.209	51.969.681	59.755.401
22	8.978	8.289	68.707.521	74.418.642	8.978	7.173	51.451.929	64.399.194
23	9.413	8.978	80.604.484	84.509.914	9.413	8.289	68.707.521	78.024.357
24	9.526	9.413	88.604.569	89.668.238	9.526	8.978	80.604.484	85.524.428
25	7.555	9.526	90.744.676	71.968.930	7.555	9.413	88.604.569	71.115.215
26	7.964	7.555	57.078.025	60.168.020	7.964	9.526	90.744.676	75.865.064
27	7.263	7.964	63.425.296	57.842.532	7.263	7.555	57.078.025	54.871.965
28	7.919	7.263	52.751.169	57.515.697	7.919	7.964	63.425.296	63.066.916
29	8.254	7.919	62.710.561	65.363.426	8.254	7.263	52.751.169	59.948.802
30	9.183	8.254	68.128.516	75.796.482	9.183	7.919	62.710.561	72.720.177
31	9.771	9.183	84.327.489	89.727.093	9.771	8.254	68.128.516	80.649.834
32	9.628	9.771	95.472.441	94.075.188	9.628	9.183	84.327.489	88.413.924
33	12.648	9.628	92.698.384	121.774.944	12.648	9.771	95.472.441	123.583.608
34	12.109	12.648	159.971.904	153.154.632	12.109	9.628	92.698.384	116.585.452
35	11.048	12.109	146.627.881	133.780.232	11.048	12.648	159.971.904	139.735.104
36	10.749	11.048	122.058.304	118.754.952	10.749	12.109	146.627.881	130.159.641
37	8.975	10.749	115.541.001	96.472.275	8.975	11.048	122.058.304	99.155.800
38	8.476	8.975	80.550.625	76.072.100	8.476	10.749	115.541.001	91.108.524
39	8.165	8.476	71.842.576	69.206.540	8.165	8.975	80.550.625	73.260.875
40	9.153	8.165	66.667.225	74.734.245	9.153	8.476	71.842.576	77.580.828
41	9.387	9.153	83.777.409	85.919.211	9.387	8.165	66.667.225	76.644.855
42	8.778	9.387	88.115.769	82.399.086	8.778	9.153	83.777.409	80.345.034
43	9.189	8.778	77.053.284	80.661.042	9.189	9.387	88.115.769	86.257.143
44	9.681	9.189	84.437.721	88.958.709	9.681	8.778	77.053.284	84.979.818
Jumlah	372.001	367.235	3.238.279.849	3.253.368.299	366.290	358.046	3.153.842.128	3.173.388.608
	b =	0,75			b =	0,50		
	b0 =	2.256,28			b0 =	4.455,87		

Sumber: Data sekunder perusahaan yang diteliti

Pengukuran Kesalahan Peramalan Metode Autoregresi Produk Jamu Gempur Angin

waktu	Autoregresi order 1				Autoregresi order 2			
	AD	SE	APE	PE	AD	SE	APE	PE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1								
2	225,57	50.882,04	3,95%	-3,95%				
3	8,39	70,47	0,13%	0,13%	374,02	139.892,47	5,72%	-5,72%
4	144,90	20.996,35	1,99%	1,99%	14,29	204,21	0,20%	-0,20%
5	1.083,68	1.174.361,62	16,33%	-16,33%	1.090,57	1.189.342,43	16,43%	-16,43%
6	1.087,27	1.182.153,47	13,08%	13,08%	206,17	42.508,08	2,48%	2,48%
7	129,70	16.563,40	1,54%	-1,54%	575,90	331.657,99	6,89%	6,89%
8	518,10	268.425,96	5,74%	5,74%	413,33	170.844,13	4,58%	4,58%
9	480,92	231.282,23	5,06%	5,06%	862,82	744.458,03	9,08%	9,08%
10	1.149,74	1.321.894,76	10,93%	10,93%	1.544,59	2.385.764,72	14,69%	14,69%
11	106,03	11.241,58	1,06%	-1,06%	817,93	669.016,19	8,16%	8,16%
12	634,62	402.746,27	6,95%	-6,95%	589,41	347.403,57	6,46%	-6,46%
13	2.191,96	4.804.691,38	31,77%	-31,77%	2.572,24	6.616.438,02	37,28%	-37,28%
14	582,91	339.788,14	8,52%	-8,52%	2.183,44	4.767.417,21	31,92%	-31,92%
15	77,99	6.081,85	1,07%	-1,07%	608,19	369.895,94	8,33%	-8,33%
16	566,57	321.003,32	6,84%	6,84%	410,83	168.780,88	4,96%	4,96%
17	1.055,98	1.115.092,07	14,26%	-14,26%	701,33	491.857,40	9,47%	-9,47%
18	76,55	5.869,70	0,99%	-0,99%	877,16	769.407,25	11,35%	-11,35%
19	832,41	692.909,56	11,55%	-11,55%	952,86	907.945,05	13,22%	-13,22%
20	481,29	231.638,91	6,71%	-6,71%	1.148,47	1.318.980,97	16,01%	-16,01%
21	661,67	437.803,94	7,98%	-7,98%	226,21	51.168,79	2,73%	2,73%
22	515,02	265.246,42	5,74%	5,74%	933,22	870.894,57	10,39%	10,39%
23	434,11	188.448,26	4,61%	4,61%	809,84	655.843,05	8,60%	8,60%
24	221,38	49.010,76	2,32%	2,32%	578,11	334.210,33	6,07%	6,07%
25	1.834,23	3.364.396,86	24,28%	-24,28%	1.610,54	2.593.830,30	21,32%	-21,32%
26	50,63	2.563,47	0,64%	0,64%	1.258,08	1.582.753,55	15,80%	-15,80%
27	956,62	915.128,13	13,17%	-13,17%	972,91	946.556,52	13,40%	-13,40%
28	224,28	50.300,03	2,83%	2,83%	521,55	272.013,51	6,59%	-6,59%
29	68,07	4.633,82	0,82%	0,82%	164,19	26.957,37	1,99%	1,99%
30	746,23	556.856,76	8,13%	8,13%	764,97	585.173,01	8,33%	8,33%
31	638,60	407.816,16	6,54%	6,54%	1.185,35	1.405.062,13	12,13%	12,13%
32	55,32	3.060,07	0,57%	0,57%	577,54	333.552,70	6,00%	6,00%
33	3.182,39	10.127.634,48	25,16%	25,16%	3.303,34	10.912.069,23	26,12%	26,12%
34	382,06	145.967,15	3,16%	3,16%	2.835,89	8.042.273,81	23,42%	23,42%
35	275,35	75.816,03	2,49%	-2,49%	263,87	69.628,93	2,39%	2,39%
36	220,12	48.451,20	2,05%	2,05%	234,55	55.015,83	2,18%	2,18%
37	1.330,00	1.768.889,97	14,82%	-14,82%	1.008,59	1.017.249,86	11,24%	-11,24%
38	500,65	250.647,78	5,91%	-5,91%	1.357,99	1.844.129,59	16,02%	-16,02%
39	438,00	191.846,14	5,36%	-5,36%	781,39	610.569,89	9,57%	-9,57%
40	782,87	612.886,12	8,55%	8,55%	456,28	208.189,96	4,99%	4,99%
41	277,07	76.766,94	2,95%	2,95%	845,88	715.518,30	9,01%	9,01%
42	507,15	257.198,87	5,78%	-5,78%	257,45	66.280,34	2,93%	-2,93%
43	359,86	129.501,92	3,92%	3,92%	36,47	1.330,17	0,40%	0,40%
44	544,11	296.058,01	5,62%	5,62%	633,18	694.163,32	8,61%	8,61%

Autoregresi order 1				Autoregresi order 2			
MAD	MSE	MAPE	MPE	MAD	MSE	MAPE	MPE
619,52	754.060,75	7,25%	-0,96%	699,07	1.317.292,13	10,41%	-1,64%
Batas toleransi kesalahan peramalan = 1.702,00				Batas toleransi kesalahan peramalan = 2.249,56			

Sumber: Data sekunder perusahaan yang diolah peneliti

LAMPIRAN 5
METODE PERAMALAN DEKOMPOSISI
SERTA
PENGUKURAN KESALAHAN PERAMALANNYA



Produk Jamu Galian Singset

1) Tabel Pencarian Koefisien a dan b dari Persamaan Regresi Untuk Mendapatkan Persamaan Trend

waktu (X)	(Y)	X kuadrat	XY
(1)	(2)	(3)	(4)
1	6.344	1	6.344
2	6.511	4	13.022
3	6.539	9	19.617
4	6.544	16	26.576
5	6.779	25	33.895
6	6.412	36	38.472
7	5.799	49	40.593
8	6.262	64	50.096
9	6.209	81	55.881
10	5.510	100	55.100
11	5.376	121	59.136
12	5.750	144	69.000
13	6.426	169	83.538
14	6.124	196	85.736
15	6.220	225	93.300
16	7.221	256	115.536
17	6.786	289	115.362
18	6.973	324	125.514
19	7.401	361	140.619
20	7.300	400	146.000
21	7.464	441	156.744
22	6.041	484	132.902
23	5.871	529	135.033
24	5.739	576	137.736
25	5.889	625	147.225
26	5.243	676	136.318
27	3.236	729	87.372
28	3.293	784	92.204
29	3.596	841	104.284
30	3.770	900	113.100
31	3.786	961	117.366
32	3.878	1.024	124.096
33	4.369	1.089	144.177
34	4.216	1.156	143.344
35	4.424	1.225	154.840
36	4.639	1.296	167.004
666	204.040	16.206	3.467.082

Sumber: Data sekunder perusahaan yang diolah peneliti

$$Y = a + bX$$

$b = (79,19)$
 $a = 7.132,82$



2) Tabel Perhitungan Gerakan Musiman

waktu	(Y)	Total Bergerak 12 bulan	Total Pegerakan 2 periode kolom 4	Rata-rata Bergerak 12 bulan terpusat	Gerakan Musiman
(1)	(2)	(3)	(4)	(5)	(6)
1	Jan '96	6.344			
2	Feb '96	6.511			
3	Mar '96	6.539			
4	Apr '96	6.644			
5	May '96	6.779			
6	Jun '96	6.412	74.135		
7	Jul '96	5.799	74.217	148.352	6.181,33
8	Aug '96	6.262	73.830	148.047	6.168,63
9	Sep '96	6.209	73.511	147.341	6.139,21
10	Oct '96	5.510	74.088	147.599	6.149,96
11	Nov '96	5.376	74.095	148.183	6.174,29
12	Dec '96	5.750	74.656	148.751	6.197,96
13	Jan '97	6.426	76.258	150.914	6.288,08
14	Feb '97	6.124	77.296	153.554	6.398,08
15	Mar '97	6.220	78.551	155.847	6.493,63
16	Apr '97	7.221	79.082	157.633	6.568,04
17	May '97	6.786	79.577	158.659	6.610,79
18	Jun '97	6.973	79.566	159.143	6.630,96
19	Jul '97	7.401	79.029	158.595	6.608,13
20	Aug '97	7.300	78.148	157.177	6.549,04
21	Sep '97	7.464	75.164	153.312	6.388,00
22	Oct '97	6.041	71.236	146.400	6.100,00
23	Nov '97	5.971	68.046	139.282	5.803,42
24	Dec '97	5.739	64.843	132.889	5.537,04
25	Jan '98	5.889	61.228	126.071	5.252,96
26	Feb '98	5.243	57.806	119.034	4.959,75
27	Mar '98	3.236	54.711	112.517	4.688,21
28	Apr '98	3.293	52.886	107.597	4.483,21
29	May '98	3.596	51.439	104.325	4.346,88
30	Jun '98	3.770	50.339	101.778	4.240,75
31	Jul '98	3.786			
32	Aug '98	3.978			
33	Sep '98	4.369			
34	Oct '98	4.216			
35	Nov '98	4.424			
36	Dec '98	4.639			

Sumber: Data sekunder perusahaan yang diolah peneliti

Keterangan :

- (4) = pada baris waktu ke 6 merupakan jumlah kolom (3) dari baris waktu ke 1 hingga 12 dst
- (5) = pada baris waktu ke 7 merupakan jumlah dari kolom (4) baris waktu ke 6 dan 7 dst
- (6) = Kolom 5 dibagi 24 bulan
- (7) = kolom (3) dibagi kolom (6)

3) Tabel Perhitungan Indeks Musim

	Gerakan Musiman			rata-rata	Indeks Musim (S)
	1996	1997	1998		
	(2)	(3)	(4)	(5)	(6)
Jan		102,19%	112,11%	107,15%	109,27%
Feb		95,72%	105,71%	100,71%	102,71%
Mar		95,79%	69,02%	82,41%	84,04%
Apr		109,94%	73,45%	91,70%	93,51%
May		102,65%	82,73%	92,69%	94,52%
Jun		105,16%	88,90%	97,03%	98,95%
Jul	93,81%	112,00%		102,91%	104,94%
Aug	101,51%	111,47%		106,49%	108,60%
Sep	101,14%	116,84%		108,99%	111,15%
Oct	89,59%	99,03%		94,31%	96,18%
Nov	87,07%	101,16%		94,12%	95,98%
Dec	92,77%	103,65%		98,21%	100,15%
				1176,71%	1200,00%

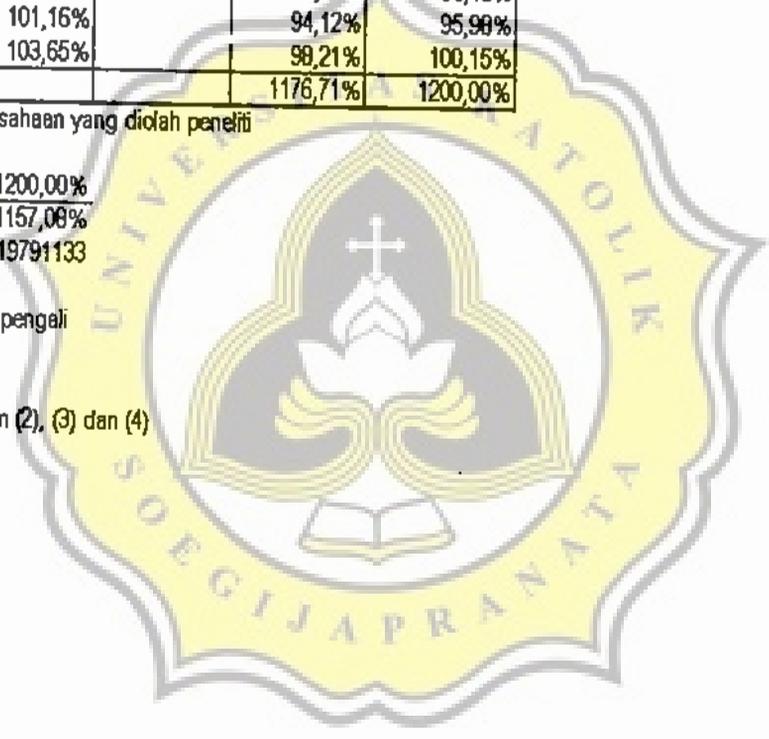
Sumber: Data sekunder perusahaan yang diolah peneliti

$$\begin{aligned} \text{Indeks Pengali} &= \frac{1200,00\%}{1176,08\%} \\ &= 1,019791133 \end{aligned}$$

$$S = \text{kolom (6)} \times \text{indeks pengali}$$

Keterangan :

(5) Rata-rata = Rata-rata kolom (2), (3) dan (4)



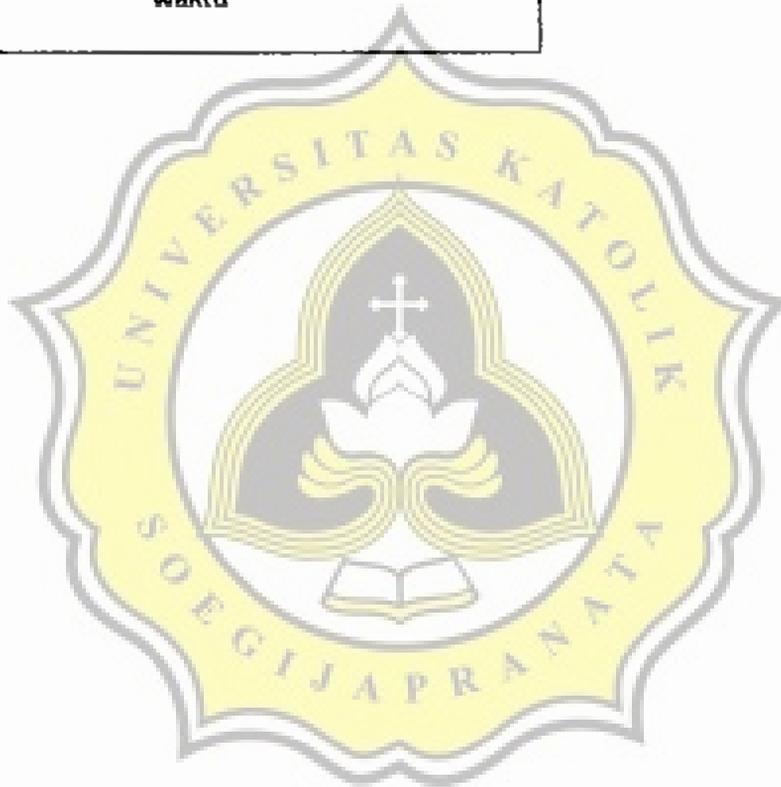
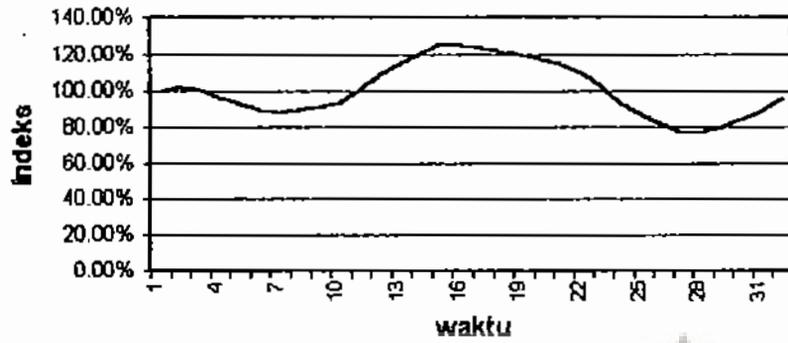
4) Tabel Pemisahan Komponen Trend, Indeks Musim, Siklikal, dan Iregular

waktu	(Y)	Trend (T)	Indeks Musim (S)	Penyesuaian Musim TCI	Siklikal- Iregular (CI)	Siklikal (C)	Iregular (I)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	6.344	7.053,62	109,27%	5.805,73	82,31%		
2	6.511	6.974,43	102,71%	6.339,40	90,89%		
3	6.539	6.895,24	84,04%	7.781,18	112,85%	99,35%	113,59%
4	6.644	6.816,05	93,51%	7.105,01	104,24%	102,35%	101,84%
5	6.779	6.736,86	94,52%	7.171,83	106,46%	100,98%	105,43%
6	6.412	6.657,67	98,95%	6.480,10	97,33%	96,15%	101,23%
7	5.799	6.578,48	104,94%	5.525,84	84,00%	92,70%	90,61%
8	6.262	6.499,29	108,60%	5.766,23	88,72%	89,48%	99,15%
9	6.209	6.420,09	111,15%	5.586,27	87,01%	87,91%	98,98%
10	5.510	6.340,90	96,18%	5.728,84	90,35%	89,68%	100,75%
11	5.376	6.261,71	95,98%	5.601,15	89,45%	91,21%	98,08%
12	5.750	6.182,52	100,15%	5.741,18	92,86%	93,60%	99,21%
13	6.426	6.103,33	109,27%	5.880,77	96,35%	100,43%	95,94%
14	6.124	6.024,14	102,71%	5.962,60	98,98%	108,87%	90,92%
15	6.220	5.944,95	84,04%	7.401,58	124,50%	115,11%	108,16%
16	7.221	5.865,76	93,51%	7.722,05	131,65%	120,53%	109,22%
17	6.786	5.786,56	84,52%	7.179,23	124,07%	125,80%	98,62%
18	6.973	5.707,37	98,95%	7.047,06	123,47%	125,13%	98,68%
19	7.401	5.628,18	104,94%	7.052,38	125,30%	123,35%	101,58%
20	7.300	5.548,99	108,60%	6.722,05	121,14%	121,84%	99,42%
21	7.464	5.469,80	111,15%	6.715,40	122,77%	120,18%	102,16%
22	6.041	5.390,61	96,18%	6.280,93	116,52%	117,02%	99,57%
23	5.871	5.311,42	95,98%	6.116,88	115,16%	113,71%	101,28%
24	5.739	5.232,23	100,15%	5.730,20	109,52%	109,28%	100,22%
25	5.889	5.153,03	109,27%	5.389,33	104,59%	101,40%	103,15%
26	5.243	5.073,84	102,71%	5.104,82	100,61%	92,69%	108,54%
27	3.236	4.994,65	84,04%	3.850,72	77,10%	86,52%	89,11%
28	3.293	4.915,46	93,51%	3.521,49	71,64%	81,62%	87,77%
29	3.596	4.836,27	94,52%	3.804,38	78,66%	76,92%	102,26%
30	3.770	4.757,08	98,95%	3.810,04	80,09%	77,03%	103,97%
31	3.786	4.677,89	104,94%	3.607,66	77,12%	80,10%	96,28%
32	3.878	4.598,70	108,60%	3.570,98	77,65%	84,11%	92,32%
33	4.369	4.519,50	111,15%	3.930,81	86,97%	89,23%	97,47%
34	4.216	4.440,31	96,18%	4.383,45	98,72%	95,44%	103,43%
35	4.424	4.361,12	95,98%	4.609,28	105,69%		
36	4.639	4.281,93	100,15%	4.631,88	108,17%		

Sumber: Data sekunder perusahaan yang diolah peneliti

- Keterangan :
- (3) Trend = $a + bX$
 - (4) lihat tabel 3)
 - (7) C = rata-rata 5 periode
 - (5) TCI = kolom (2) / kolom (4)
 - (6) CI = kolom (5) / kolom (3)
 - C pada baris waktu 3 merupakan rata-rata kolom CI baris waktu 1 hingga 5 dst

Pola Siklikal Produk Jamu Galian Singset



5) Tabel Perhitungan Data Peramalan Dekomposisi

a) Data Realisasi yang Didekomposisikan Periode Januari 1999 - Agustus 1999

waktu		(Y)	Trend (T)	Indeks Musim (S)	Penyesuaian Musim TCI	Siklikal- Irregular (CI)	Siklikal (C)	Irregular (I)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
37	Jan '99	4.186	4.202,74	109,27%	3.830,83	91,15%	100,93%	90,31%
38	Feb '99	3.800	4.123,55	102,71%	3.699,85	89,72%	98,07%	91,49%
39	Mar '99	3.735	4.044,36	84,04%	4.444,52	109,89%	95,83%	114,68%
40	Apr '99	3.389	3.965,17	93,51%	3.624,16	91,40%	97,06%	94,17%
41	May '99	3.562	3.885,97	94,52%	3.768,41	96,97%	100,67%	96,33%
42	Jun '99	3.665	3.806,78	98,95%	3.703,92	97,30%	98,40%	98,88%
43	Jul '99	4.217	3.727,59	104,94%	4.018,36	107,80%		
44	Aug '99	3.904	3.648,40	108,60%	3.594,92	98,53%		

b) Data Peramalan Berdasarkan Metode Dekomposisi untuk Periode Januari 1999 - Agustus 1999

waktu	(Y)	Trend (T)	Indeks musim (S)	Penyesuaian Musim TCI	Siklikal- Irregular (CI)	Siklikal' (C')	Irregular' (I')	(Y')
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
37	4.186	4.202,74	109,27%	3.830,83	91,15%	100,00%	100,00%	4.592,39
38	3.800	4.123,55	102,71%	3.699,85	89,72%	100,00%	100,00%	4.235,16
39	3.735	4.044,36	84,04%	4.444,52	109,89%	100,00%	100,00%	3.398,72
40	3.389	3.965,17	93,51%	3.624,16	91,40%	100,00%	100,00%	3.707,88
41	3.562	3.885,97	94,52%	3.768,41	96,97%	100,00%	100,00%	3.673,13
42	3.665	3.806,78	98,95%	3.703,92	97,30%	100,00%	100,00%	3.766,78
43	4.217	3.727,59	104,94%	4.018,36	107,80%	100,00%	100,00%	3.911,86
44	3.904	3.648,40	108,60%	3.594,92	98,53%	100,00%	100,00%	3.962,08
45		3.569,21	111,15%			100,00%	100,00%	3.967,09

Sumber: Data sekunder perusahaan yang diolah peneliti

Keterangan:

Komponen Siklikal' (C') diperoleh dari informasi berupa pola siklikal periode sebelumnya

Komponen Irregular' (I') diasumsikan = 100%

Pengukuran Kesalahan Peramalan Metode Dekomposisi Produk Jamu Galian Singset

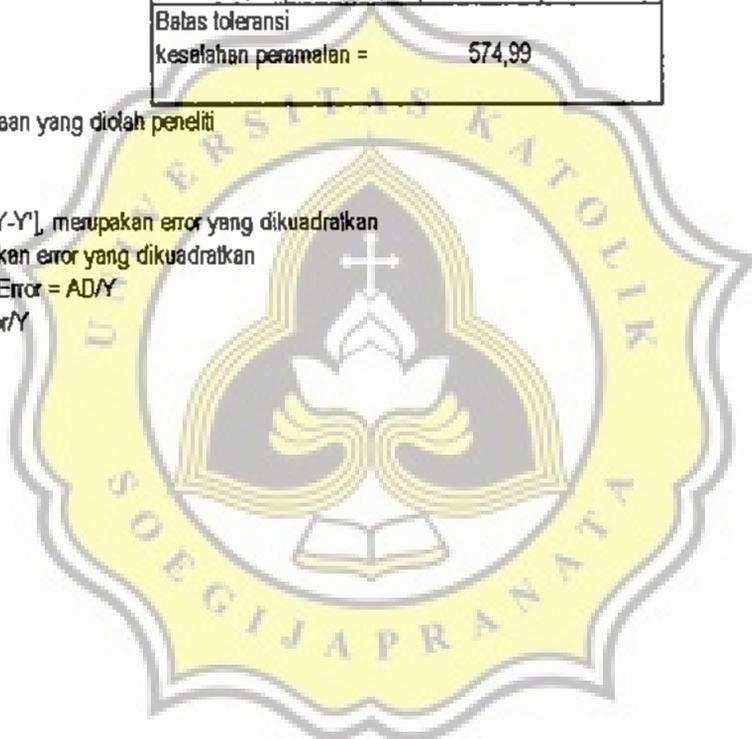
waktu	(Y)	(Y')	error	AD	SE	APE	PE
(1)	(2)	(3)	(4)	(5)	(7)	(8)	(9)
1	4.186	4.592,39	(406,39)	406,39	165.155,36	9,71%	-9,71%
2	3.800	4.235,16	(435,16)	435,16	189.368,44	11,45%	-11,45%
3	3.735	3.398,72	336,28	336,28	113.083,19	9,00%	9,00%
4	3.389	3.707,88	(318,88)	318,88	101.686,73	9,41%	-9,41%
5	3.562	3.673,13	(111,13)	111,13	12.348,80	3,12%	-3,12%
6	3.665	3.766,78	(101,78)	101,78	10.358,92	2,78%	-2,78%
7	4.217	3.911,86	305,14	305,14	93.112,92	7,24%	7,24%
8	3.904	3.952,08	(58,08)	58,08	3.373,49	1,49%	-1,49%

Metode Dekomposisi			
MAD	MSE	MAPE	MPE
259,11	86.060,98	6,77%	-2,71%
Batas toleransi kesalahan peramalan =		574,99	

Sumber: Data sekunder perusahaan yang diteliti

Keterangan:

- (5) AD = Absolute Deviation = $|Y - Y'|$, merupakan error yang dikuadratkan
- (6) SE = Square Error, merupakan error yang dikuadratkan
- (7) APE = Absolute Percentage Error = AD/Y
- (8) PE = Percentage Error = $error/Y$



Produk Jamu Pegelinu

1) Tabel Pencarian Koefisien a dan b dan Persamaan Regresi Untuk Mendapatkan Persamaan Trend

waktu (X)	(Y)	X kuadrat	XY
(1)	(2)	(3)	(4)
1	10.050	1	10.050
2	9.614	4	19.228
3	11.184	9	33.552
4	12.610	16	50.440
5	14.523	25	72.615
6	14.429	36	86.574
7	15.722	49	110.054
8	16.187	64	129.496
9	16.598	81	149.382
10	18.363	100	183.630
11	19.259	121	211.849
12	16.530	144	198.360
13	13.186	169	171.418
14	15.694	196	219.716
15	18.070	225	271.050
16	17.922	256	286.752
17	21.258	289	361.366
18	21.449	324	386.082
19	20.624	361	391.856
20	21.708	400	434.160
21	20.374	441	427.854
22	18.910	484	416.020
23	15.937	529	366.551
24	23.281	576	558.744
25	18.887	625	472.175
26	19.427	676	505.102
27	22.650	729	611.550
28	25.020	784	700.560
29	26.564	841	770.356
30	27.254	900	817.620
31	28.109	961	871.379
32	28.447	1.024	910.304
33	27.922	1.089	921.426
34	27.770	1.156	944.180
35	29.505	1.225	1.032.675
36	30.621	1.296	1.102.356
666	715.658	16.206	15.206.502

Sumber: Data sekunder perusahaan yang diolah peneliti

$$Y = a + bX$$

$$b = 506,26$$

$$a = 10.513,54$$

2) Tabel Perhitungan Gerakan Musiman

waktu		(Y)	Total Bergerak 12 bulan	Total Pergerakan 2 periode kolom 4	Rata-rata Bergerak 12 bulan terpusat	Gerakan Musiman
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Jan '96	10.050				
2	Feb '96	9.614				
3	Mar '96	11.184				
4	Apr '96	12.610				
5	May '96	14.523				
6	Jun '96	14.429	175.069			
7	Jul '96	15.722	178.205	363.274	14.719,75	106,81%
8	Aug '96	16.187	184.285	362.490	15.103,75	107,17%
9	Sep '96	16.598	191.171	375.456	15.644,00	106,10%
10	Oct '96	18.363	196.483	387.654	16.152,25	113,69%
11	Nov '96	19.259	203.218	399.701	16.654,21	115,64%
12	Dec '96	16.530	210.238	413.456	17.227,33	95,95%
13	Jan '97	13.186	215.140	425.378	17.724,08	74,40%
14	Feb '97	15.694	220.661	435.801	18.158,38	86,43%
15	Mar '97	18.070	224.437	445.098	18.545,75	97,43%
16	Apr '97	17.922	224.984	449.421	18.725,88	96,71%
17	May '97	21.258	221.662	446.646	18.610,25	114,23%
18	Jun '97	21.449	228.413	450.076	18.753,13	114,38%
19	Jul '97	20.624	234.114	462.527	19.271,96	107,02%
20	Aug '97	21.708	237.847	471.961	19.665,04	110,39%
21	Sep '97	20.374	242.427	480.274	20.011,42	101,81%
22	Oct '97	18.910	249.525	491.952	20.498,00	92,25%
23	Nov '97	15.937	254.831	504.356	21.014,83	75,84%
24	Dec '97	23.281	260.636	515.467	21.477,79	108,40%
25	Jan '98	18.887	268.121	528.757	22.031,54	85,73%
26	Feb '98	19.427	274.860	542.981	22.624,21	85,87%
27	Mar '98	22.650	282.408	557.268	23.219,50	97,55%
28	Apr '98	25.020	291.268	573.676	23.903,17	104,67%
29	May '98	26.564	304.836	596.104	24.837,67	106,95%
30	Jun '98	27.254	312.176	617.012	25.708,83	106,01%
31	Jul '98	28.109				
32	Aug '98	28.447				
33	Sep '98	27.922				
34	Oct '98	27.770				
35	Nov '98	29.505				
36	Dec '98	30.621				

Sumber: Data sekunder perusahaan yang diolah peneliti

Keterangan :

- (4) = pada baris waktu ke 6 merupakan jumlah kolom (3) dari baris waktu ke 1 hingga 12 dst
- (5) = pada baris waktu ke 7 merupakan jumlah dari kolom (4) baris waktu ke 6 dan 7 dst
- (6) = Kolom 5 dibagi 24 bulan
- (7) = kolom (3) dibagi kolom (6)

3) Tabel Perhitungan Indeks Musim

	Gerakan Musiman			rata-rata	Indeks Musim (S)
	1996	1997	1998		
	(2)	(3)	(4)		
Jan		74,40%	85,73%	80,06%	79,72%
Feb		86,43%	85,87%	86,15%	85,78%
Mar		97,43%	97,55%	97,49%	97,07%
Apr		95,71%	104,67%	100,19%	99,76%
May		114,23%	106,95%	110,59%	110,11%
Jun		114,38%	106,01%	110,19%	109,72%
Jul	106,81%	107,02%		106,91%	106,45%
Aug	107,17%	110,39%		108,78%	108,31%
Sep	106,10%	101,81%		103,96%	103,51%
Oct	113,69%	92,25%		102,97%	102,53%
Nov	115,64%	75,84%		95,74%	95,33%
Dec	95,95%	108,40%		102,17%	101,73%
				1205,20%	1200,00%

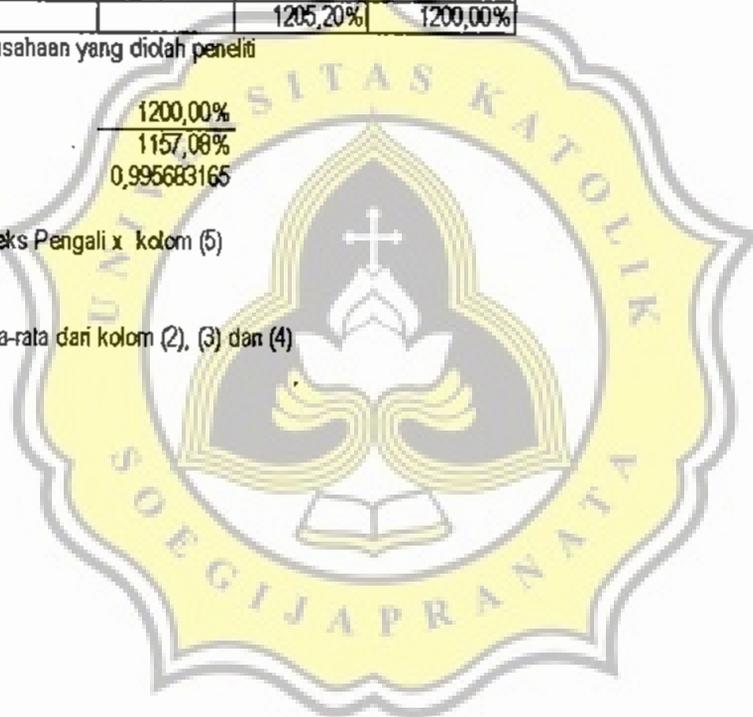
Sumber: Data sekunder perusahaan yang diolah peneliti

$$\begin{aligned} \text{Indeks Pengali} &= \frac{1200,00\%}{1157,08\%} \\ &= 0,995663165 \end{aligned}$$

$$S = \text{Indeks Pengali} \times \text{kolom (5)}$$

Keterangan :

(5) Rata-rata = Rata-rata dari kolom (2), (3) dan (4)



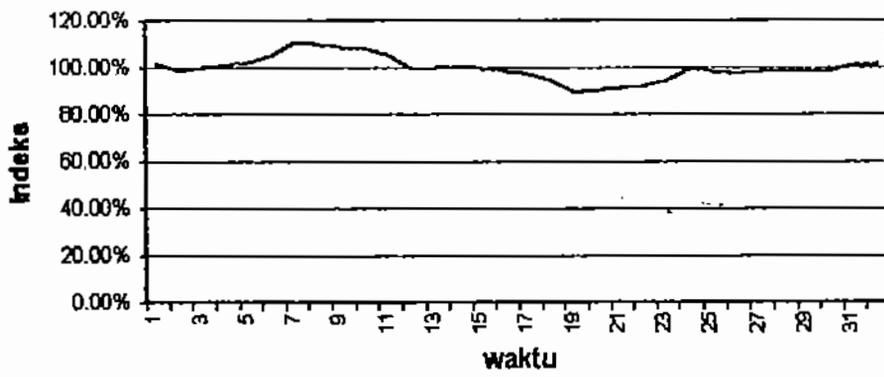
4) Tabel Pemisahan Komponen Trend, Indeks Musim, Siklikal, dan Iregular

waktu	(Y)	Trend (T)	Indeks Musim (S)	Penyesuaian Musim TCI	Siklikal- Iregular (Ci)	Siklikal (C)	Iregular (I)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	10.050	11.019,80	79,72%	12.607,27	114,41%		
2	9.614	11.526,06	85,78%	11.208,21	97,24%		
3	11.184	12.032,32	97,07%	11.521,56	95,76%	101,87%	94,00%
4	12.610	12.538,59	99,76%	12.640,69	100,81%	98,39%	102,46%
5	14.523	13.044,85	110,11%	13.189,35	101,11%	99,96%	101,15%
6	14.429	13.551,11	109,72%	13.151,08	97,05%	101,33%	95,77%
7	15.722	14.057,37	106,45%	14.769,28	105,06%	102,45%	102,55%
8	16.187	14.563,63	108,31%	14.944,95	102,62%	105,23%	97,52%
9	16.598	15.069,90	103,51%	16.035,74	106,41%	110,94%	95,92%
10	18.363	15.576,16	102,53%	17.910,68	114,99%	109,52%	104,99%
11	19.259	16.082,42	95,33%	20.203,43	125,62%	108,35%	115,95%
12	16.530	16.588,68	101,73%	16.248,44	97,95%	107,85%	90,82%
13	13.186	17.094,95	79,72%	16.541,24	96,76%	106,42%	91,79%
14	15.694	17.601,21	85,78%	18.296,40	103,95%	99,60%	104,37%
15	18.070	18.107,47	97,07%	18.615,40	102,81%	100,20%	102,60%
16	17.922	18.613,73	99,76%	17.965,61	96,52%	100,77%	95,78%
17	21.258	19.120,00	110,11%	19.305,88	100,97%	99,23%	101,76%
18	21.449	19.626,26	109,72%	19.549,34	99,61%	98,09%	101,55%
19	20.624	20.132,52	106,45%	19.374,22	96,23%	97,40%	98,80%
20	21.708	20.638,78	108,31%	20.042,32	97,11%	94,25%	103,04%
21	20.374	21.145,04	103,51%	19.683,83	93,09%	89,41%	104,11%
22	18.910	21.651,31	102,53%	18.444,21	85,19%	90,36%	94,27%
23	15.937	22.157,57	95,33%	16.718,53	75,45%	91,39%	82,56%
24	23.281	22.663,83	101,73%	22.884,44	100,97%	91,91%	109,87%
25	18.887	23.170,09	79,72%	23.692,89	102,26%	94,17%	108,59%
26	19.427	23.676,36	85,78%	22.648,41	95,66%	99,39%	96,24%
27	22.650	24.182,62	97,07%	23.333,64	96,49%	98,35%	98,11%
28	25.020	24.688,88	99,76%	25.080,89	101,59%	97,23%	104,48%
29	26.564	25.195,14	110,11%	24.124,63	95,75%	98,25%	97,46%
30	27.254	25.701,41	109,72%	24.840,22	96,65%	98,61%	98,01%
31	28.109	26.207,67	106,45%	26.405,65	100,76%	98,12%	102,69%
32	28.447	26.713,93	108,31%	26.264,22	98,32%	98,50%	99,81%
33	27.922	27.220,19	103,51%	26.976,14	99,10%	101,10%	98,03%
34	27.770	27.726,45	102,53%	27.085,97	97,69%	101,90%	95,87%
35	29.505	28.232,72	95,33%	30.951,88	109,63%		
36	30.621	28.738,98	101,73%	30.099,42	104,73%		

Sumber: Data sekunder perusahaan yang diolah peneliti

- Keterangan :
- (3) Trend = $a + bX$
 - (4) lihat tabel 3
 - (5) TCI = kolom (2) / kolom (4)
 - (6) Ci = kolom (5) / kolom (3)
 - (7) C = rata-rata 5 periode
C pada baris waktu 3 merupakan rata-rata kolom Ci baris waktu 1 hingga 5 dst

Pola Siklikai Produk Jamu Pegelinu



5) Tabel Perhitungan Data Peramalan Dekomposisi

a) Data Realisasi yang Didekomposisikan Periode Januari 1999 - Agustus 1999

waktu		(Y)	Trend (T)	Indeks Musim (S)	Penyesuaian Musim TCI	Siklikal- Iregular (CI)	Siklikal (C)	Iregular (I)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
37	Jan '99	20.675	29.245,24	79,72%	25935,85	88,68%	98,54%	90,00%
38	Feb '99	25.423	29.751,50	85,78%	29638,68	99,62%	96,01%	103,76%
39	Mar '99	26.437	30.257,77	97,07%	27234,94	90,01%	93,12%	96,66%
40	Apr '99	29.764	30.764,03	99,76%	29836,43	96,98%	94,35%	102,80%
41	May '99	31.087	31.270,29	110,11%	28232,29	90,28%	93,61%	96,45%
42	Jun '99	33.064	31.776,55	109,72%	30135,65	94,84%	95,89%	98,90%
43	Jul '99	32.964	32.282,82	106,45%	30966,44	95,92%		
44	Aug '99	36.028	32.789,08	108,31%	33263,52	101,45%		

b) Data Peramalan Berdasarkan Metode Dekomposisi untuk Periode Januari 1999 - Agustus 1999

waktu	(Y)	Trend (T)	Indeks Musim (S)	Penyesuaian Musim TCI	Siklikal- Iregular (CI)	Siklikal' (C')	Iregular' (I')	(Y')
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
37	20.675	29.245,24	79,72%	25935,85	88,68%	98,00%	100,00%	22.846,85
38	25.423	29.751,50	85,78%	29638,68	99,62%	98,00%	100,00%	25.009,38
39	26.437	30.257,77	97,07%	27234,94	90,01%	98,00%	100,00%	28.783,84
40	29.764	30.764,03	99,76%	29836,43	96,98%	98,00%	100,00%	30.075,56
41	31.087	31.270,29	110,11%	28232,29	90,28%	98,00%	100,00%	33.743,55
42	33.064	31.776,55	109,72%	30135,65	94,84%	98,00%	100,00%	34.167,07
43	32.964	32.282,82	106,45%	30966,44	95,92%	98,00%	100,00%	33.677,98
44	36.028	32.789,08	108,31%	33263,52	101,45%	98,00%	100,00%	34.803,84
45		33.295,34	103,51%			98,00%	100,00%	33.773,51

Sumber: Data sekunder perusahaan yang diolah peneliti

Keterangan:

Komponen Siklikal' (C') diperoleh dari informasi berupa pola siklikal periode sebelumnya

Komponen Iregular' (I') diasumsikan = 100%

Pengukuran Kesalahan Peramalan Metode Dekomposisi Produk Jamu Pegelinu

waktu	(Y)	(Y')	error	AD	SE	APE	PE
(1)	(2)	(3)	(4)	(5)	(7)	(8)	(9)
1	20.675	22.846,85	(2.171,85)	2.171,85	4.716.921,43	10,50%	-10,50%
2	25.423	25.009,38	413,62	413,62	171.079,74	1,63%	1,63%
3	26.437	28.783,84	(2.346,84)	2.346,84	5.507.653,36	8,88%	-8,88%
4	29.764	30.075,56	(311,56)	311,56	97.066,98	1,05%	-1,05%
5	31.087	33.743,55	(2.656,55)	2.656,55	7.057.257,97	8,55%	-8,55%
6	33.064	34.167,07	(1.103,07)	1.103,07	1.216.765,89	3,34%	-3,34%
7	32.964	33.677,98	(713,98)	713,98	509.768,60	2,17%	-2,17%
8	36.028	34.803,84	1.224,16	1.224,16	1.498.566,27	3,40%	3,40%

Metode Dekomposisi			
MAD	MSE	MAPE	MPE
1.367,70	2.596.885,03	4,94%	-3,68%
Batas toleransi kesalahan peramalan =		3.158,51	

Sumber: Data sekunder perusahaan yang diteliti



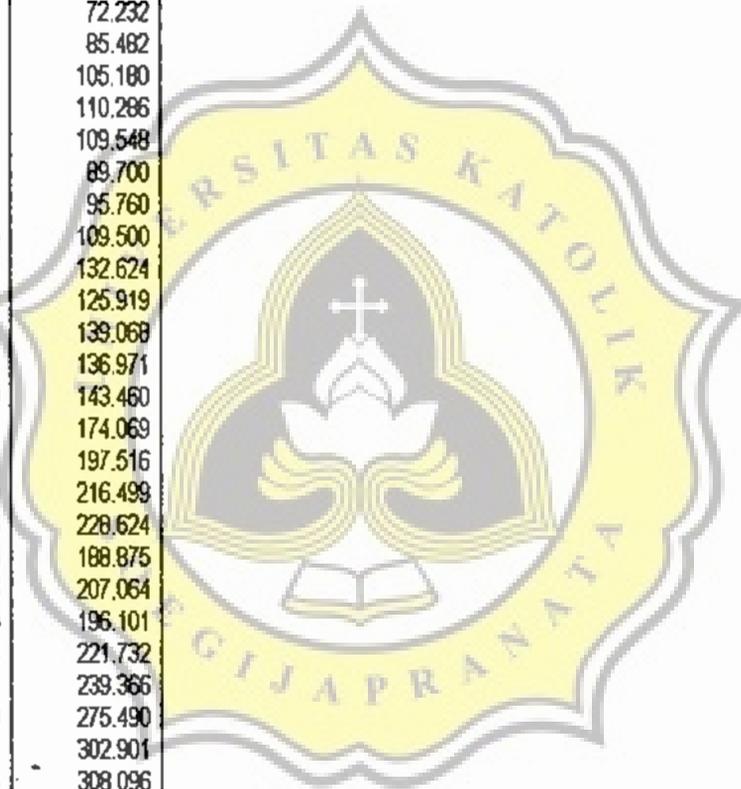
Produk Jamu Gempur Angin

1) Tabel Pencarian Koefisien a dan b dari Persamaan Regresi Untuk Mendapatkan Persamaan Trend

waktu (X)	(Y)	X kuadrat	XY
(1)	(2)	(3)	(4)
1	4.915	1	4.915
2	5.711	4	11.422
3	6.541	9	19.623
4	7.299	16	29.196
5	6.638	25	33.190
6	8.314	36	49.884
7	8.353	49	58.471
8	9.029	64	72.232
9	9.498	81	85.482
10	10.518	100	105.180
11	10.026	121	110.286
12	9.129	144	109.548
13	6.900	169	89.700
14	6.840	196	95.760
15	7.300	225	109.500
16	8.289	256	132.624
17	7.407	289	125.919
18	7.726	324	139.068
19	7.209	361	136.971
20	7.173	400	143.460
21	8.289	441	174.069
22	8.978	484	197.516
23	9.413	529	216.499
24	9.526	576	228.624
25	7.555	625	188.875
26	7.964	676	207.064
27	7.263	729	196.101
28	7.919	784	221.732
29	8.254	841	239.366
30	9.183	900	275.490
31	9.771	961	302.901
32	9.628	1.024	308.096
33	12.648	1.089	417.384
34	12.109	1.156	411.706
35	11.048	1.225	386.680
36	10.749	1.296	386.964
666	306.112	16.206	6.021.498

Sumber: Data sekunder perusahaan yang diolah peneliti

Trend = a + bX b = 97,02
 a = 6.680,45



2) Tabel Perhitungan Gerakan Musiman

waktu		(Y)	Total Bergerak 12 bulan	Total Pergerakan 2 bulan kolom 4	Rata-rata Bergerak 12 bulan terpusal	Gerakan Musiman
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Jan '96	4.915				
2	Feb '96	5.711				
3	Mar '96	6.541				
4	Apr '96	7.299				
5	May '96	6.638				
6	Jun '96	8.314	95.971			
7	Jul '96	8.353	97.956	193.927	8.080,29	103,37%
8	Aug '96	9.029	99.085	197.041	8.210,04	109,98%
9	Sep '96	9.498	99.844	198.929	8.288,71	114,59%
10	Oct '96	10.518	100.834	200.678	8.361,58	125,79%
11	Nov '96	10.026	101.603	202.437	8.434,88	118,86%
12	Dec '96	9.129	101.015	202.618	8.442,42	108,13%
13	Jan '97	6.900	99.871	200.886	8.370,25	82,43%
14	Feb '97	6.840	98.015	197.886	8.245,25	82,96%
15	Mar '97	7.300	96.806	194.821	8.117,54	89,93%
16	Apr '97	8.289	95.266	192.072	8.003,00	103,57%
17	May '97	7.407	94.653	189.919	7.913,29	93,60%
18	Jun '97	7.726	95.050	189.703	7.904,29	97,74%
19	Jul '97	7.209	95.705	190.755	7.948,13	90,70%
20	Aug '97	7.173	96.829	192.534	8.022,25	89,41%
21	Sep '97	8.289	96.792	193.621	8.067,54	102,75%
22	Oct '97	8.978	96.422	193.214	8.050,58	111,52%
23	Nov '97	9.413	97.269	193.691	8.070,46	116,64%
24	Dec '97	9.526	98.726	195.995	8.166,46	116,65%
25	Jan '98	7.555	101.288	200.014	8.333,92	90,65%
26	Feb '98	7.964	103.743	205.031	8.542,96	93,22%
27	Mar '98	7.263	108.102	211.845	8.826,88	82,28%
28	Apr '98	7.919	111.233	219.335	9.138,96	86,65%
29	May '98	8.254	112.868	224.101	9.337,54	88,40%
30	Jun '98	9.183	114.091	226.959	9.456,63	97,11%
31	Jul '98	9.771				
32	Aug '98	9.628				
33	Sep '98	12.648				
34	Oct '98	12.109				
35	Nov '98	11.048				
36	Dec '98	10.749				

Sumber: Data sekunder perusahaan yang diolah peneliti

Keterangan :

- (4) = pada baris waktu ke 6 merupakan jumlah kolom (3) dari baris waktu ke 1 hingga 12 dst
- (5) = pada baris waktu ke 7 merupakan jumlah dari kolom (4) baris waktu ke 6 dan 7 dst
- (6) = Kolom 5 dibagi 24 bulan
- (7) = kolom (3) dibagi kolom (6)

3) Tabel Perhitungan Indeks Musim

	Gerakan Musiman			Rata-rata	Indeks Musim (S)
	1996	1997	1998		
(1)	(2)	(3)	(4)	(5)	(6)
Jan		82,43%	90,65%	86,54%	86,65%
Feb		82,96%	93,22%	88,09%	88,20%
Mar		89,93%	82,28%	86,11%	86,22%
Apr		103,57%	86,65%	95,11%	95,23%
May		93,60%	88,40%	91,00%	91,12%
Jun		97,74%	97,11%	97,43%	97,55%
Jul	103,37%	90,70%		97,04%	97,16%
Aug	109,98%	89,41%		99,69%	99,82%
Sep	114,59%	102,75%		108,67%	108,81%
Oct	125,79%	111,52%		118,65%	118,81%
Nov	118,86%	116,64%		117,75%	117,90%
Dec	108,13%	116,65%		112,39%	112,53%
				1198,47%	1200,00%

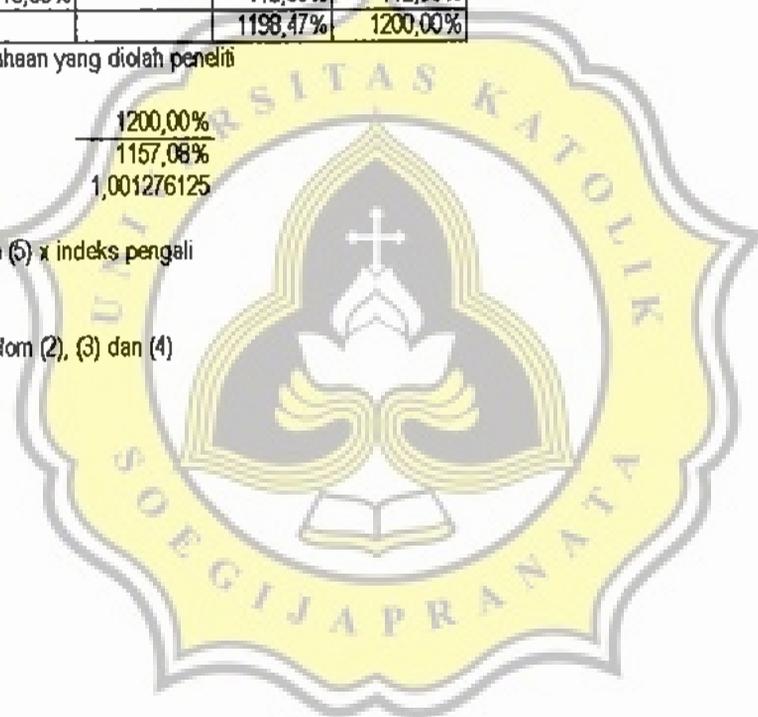
Sumber: Data sekunder perusahaan yang diolah peneliti

$$\begin{aligned} \text{Indeks Pengali} &= \frac{1200,00\%}{1157,08\%} \\ &= 1,001276125 \end{aligned}$$

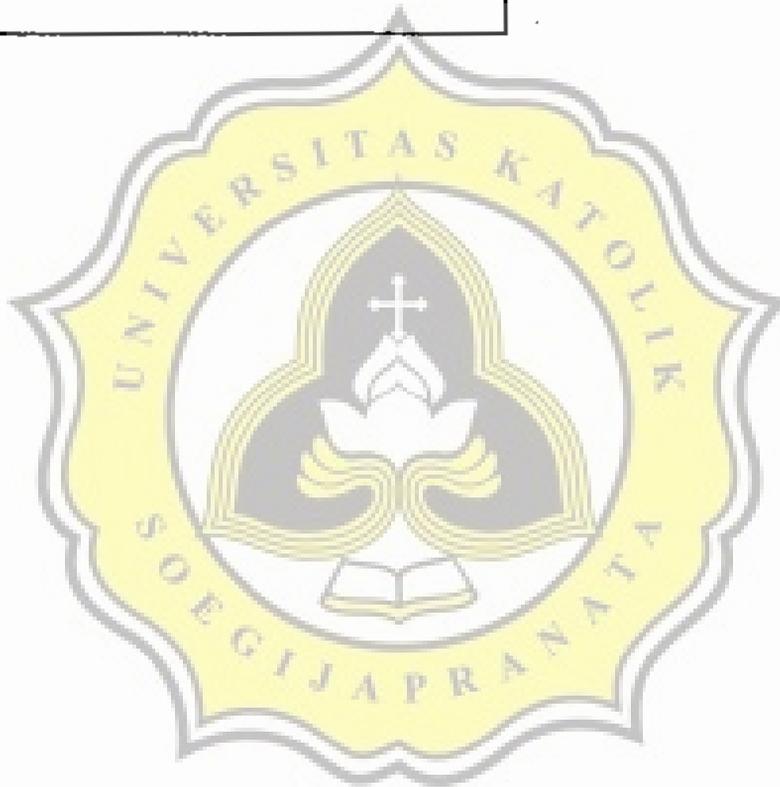
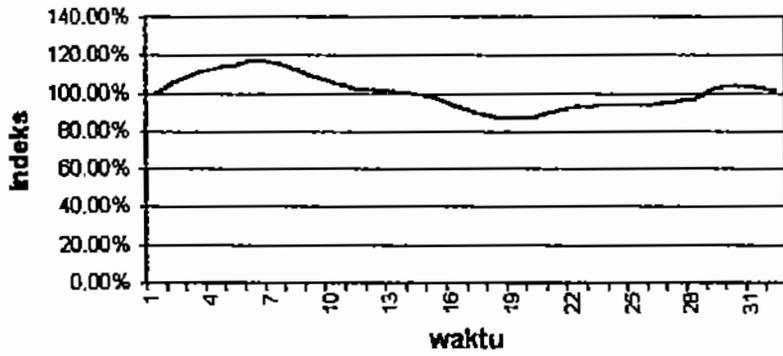
$$S = \text{kolom (5)} \times \text{indeks pengali}$$

Keterangan :

(5) Rata-rata = rata-rata dari kolom (2), (3) dan (4)



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4) Tabel Pemisahan Komponen Trend, Indeks Musim, Siklikal, dan Irregular

waktu	(Y)	Trend (T)	Indeks Musim (S)	Penyesuaian Musim (TCI)	Siklikal- Irregular (CI)	Siklikal (C)	Irregular (I)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	4.915	6.777,47	86,65%	5.671,94	83,69%		
2	5.711	6.874,49	88,20%	6.474,89	94,19%		
3	6.541	6.971,51	86,22%	7.586,79	108,83%	99,36%	109,53%
4	7.299	7.068,53	95,23%	7.664,30	108,43%	106,09%	102,20%
5	6.638	7.165,55	91,12%	7.285,29	101,67%	110,62%	91,91%
6	8.314	7.262,57	97,55%	8.522,83	117,35%	113,11%	103,75%
7	8.353	7.359,59	97,16%	8.597,01	116,81%	114,54%	101,98%
8	9.029	7.456,61	99,82%	9.045,13	121,30%	117,35%	103,37%
9	9.498	7.553,64	108,81%	8.729,30	115,56%	115,83%	99,77%
10	10.518	7.650,66	118,81%	8.653,08	115,72%	113,15%	102,27%
11	10.026	7.747,68	117,90%	8.503,84	109,76%	108,94%	100,75%
12	9.129	7.844,70	112,53%	8.112,24	103,41%	105,12%	98,37%
13	6.900	7.941,72	86,65%	7.962,64	100,26%	102,80%	97,54%
14	6.840	8.038,74	88,20%	7.754,90	96,47%	101,99%	94,59%
15	7.300	8.135,76	86,22%	8.467,14	104,07%	100,82%	103,22%
16	8.289	8.232,78	95,23%	8.703,85	105,72%	99,57%	106,18%
17	7.407	8.329,80	91,12%	8.129,28	97,59%	97,68%	99,91%
18	7.726	8.426,82	97,55%	7.920,06	93,99%	93,54%	100,48%
19	7.209	8.523,84	97,16%	7.419,59	87,05%	89,87%	96,85%
20	7.173	8.620,86	99,82%	7.185,81	83,35%	87,50%	95,26%
21	8.289	8.717,89	108,81%	7.618,15	87,39%	86,62%	100,88%
22	8.978	8.814,91	118,81%	7.556,85	85,73%	88,00%	97,41%
23	9.413	8.911,93	117,90%	7.983,90	89,59%	90,48%	99,01%
24	9.526	9.008,95	112,53%	8.465,02	93,96%	92,63%	101,44%
25	7.555	9.105,97	86,65%	8.718,51	95,75%	93,60%	102,29%
26	7.964	9.202,99	88,20%	9.029,24	98,11%	93,38%	105,07%
27	7.263	9.300,01	86,22%	8.424,23	90,58%	93,67%	96,71%
28	7.919	9.397,03	95,23%	8.315,33	88,49%	94,15%	93,99%
29	8.254	9.494,05	91,12%	9.058,88	95,42%	95,29%	100,13%
30	9.183	9.591,07	97,55%	9.413,66	98,15%	96,89%	101,31%
31	9.771	9.688,09	97,16%	10.056,44	103,80%	102,71%	101,06%
32	9.628	9.785,11	99,82%	9.645,20	98,57%	104,06%	94,73%
33	12.648	9.882,14	108,81%	11.624,36	117,63%	103,03%	114,17%
34	12.109	9.979,16	118,81%	10.192,23	102,14%	101,05%	101,08%
35	11.048	10.076,18	117,90%	9.370,68	93,00%		
36	10.749	10.173,20	112,53%	9.551,81	93,89%		

Sumber: Data sekunder perusahaan yang diolah peneliti

Keterangan :

(3) Trend = $a + bX$

(5) TCI = kolom (2) / kolom (4)

(4) lihat tabel 3)

(6) CI = kolom (5) / kolom (3)

(7) C = rata-rata 5 periode

C pada baris waktu 3 merupakan rata-rata kolom CI baris waktu 1 hingga 5 dst

5) Tabel Perhitungan Data Peramalan Dekomposisi

a) Data Realisasi yang Didekomposisikan Periode Januari 1999 - Agustus 1999

waktu		(Y)	Trend (T)	Indeks Musim (S)	Penyesuaian Musim TCI	Siklikal- Irregular (CI)	Siklikal (C)	Irregular (I)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
37	Jan '99	8.975	10.270,22	86,65%	10.357,20	100,85%	94,19%	107,07%
38	Feb '99	8.476	10.367,24	88,20%	9.609,72	92,69%	93,79%	98,83%
39	Mar '99	8.165	10.464,26	86,22%	9.470,44	90,50%	94,34%	95,93%
40	Apr '99	9.153	10.561,28	95,23%	9.611,09	91,00%	90,90%	100,11%
41	May '99	9.387	10.658,30	91,12%	10.302,36	96,66%	89,80%	107,64%
42	Jun '99	8.778	10.755,32	97,55%	8.998,48	83,67%	89,41%	93,58%
43	Jul '99	9.189	10.852,34	97,16%	9.457,44	87,15%		
44	Aug '99	9.681	10.949,36	99,82%	9.698,29	88,57%		

b) Data Peramalan Berdasarkan Metode Dekomposisi untuk Periode Januari 1999 - Agustus 1999

waktu	(Y)	Trend (T)	Indeks Musim (S)	Penyesuaian Musim TCI	Siklikal- Irregular (CI)	Siklikal' (C')	Irregular' (I')	(Y')
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
37	8.975	10.270,22	86,65%	10.357,20	100,85%	95,00%	100,00%	8.454,64
38	8.476	10.367,24	88,20%	9.609,72	92,69%	95,00%	100,00%	8.686,94
39	8.165	10.464,26	86,22%	9.470,44	90,50%	95,00%	100,00%	8.570,74
40	9.153	10.561,28	95,23%	9.611,09	91,00%	95,00%	100,00%	9.555,01
41	9.387	10.658,30	91,12%	10.302,36	96,66%	95,00%	100,00%	9.225,75
42	8.778	10.755,32	97,55%	8.998,48	83,67%	95,00%	100,00%	9.967,20
43	9.189	10.852,34	97,16%	9.457,44	87,15%	95,00%	100,00%	10.017,10
44	9.681	10.949,36	99,82%	9.698,29	88,57%	95,00%	100,00%	10.383,35
45		11.046,39	108,81%			95,00%	100,00%	11.418,18

Sumber: Data sekunder perusahaan yang diolah peneliti

Keterangan:

Komponen siklikal' (C') diperoleh dengan informasi berupa pola siklikal periode sebelumnya

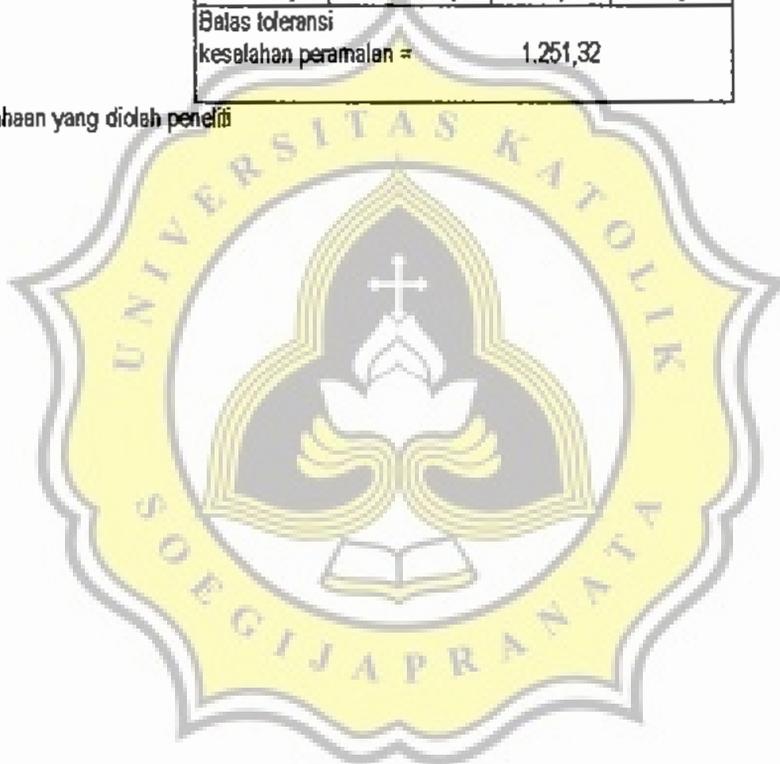
Komponen Irregular' (I') diasumsikan = 100%

Pengukuran Kesalahan Peramalan Metode Dekomposisi Produk Jamu Gempur Angin

waktu	(Y)	(Y)	error	AD	SE	APE	PE
(1)	(2)	(3)	(4)	(5)	(7)	(8)	(9)
1	8.975	8.454,64	520,36	520,36	270.770,66	5,80%	5,80%
2	8.476	8.686,94	(210,94)	210,94	44.495,54	2,49%	-2,49%
3	8.165	8.570,74	(405,74)	405,74	164.622,78	4,97%	-4,97%
4	9.153	9.555,01	(402,01)	402,01	161.608,39	4,39%	-4,39%
5	9.387	9.225,75	161,25	161,25	26.000,70	1,72%	1,72%
6	8.778	9.967,20	(1.189,20)	1.189,20	1.414.205,99	13,55%	-13,55%
7	9.189	10.017,10	(828,10)	828,10	685.749,49	9,01%	-9,01%
8	9.681	10.383,35	(702,35)	702,35	493.291,69	7,25%	-7,25%

Metode Dekomposisi			
MAD	MSE	MAPE	MPE
552,49	407.593,16	6,15%	-4,27%
Batas toleransi kesalahan peramalan =		1.251,32	

Sumber: Data sekunder perusahaan yang diolah peneliti





SURAT KETERANGAN

Yang bertanda tangan dibawah ini menerangkan bahwa :

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Jurusan : *Akuntansi*
Universitas Katolik Soegijapranata

Telah melakukan penelitian di perusahaan kami dalam rangka menyusun tugas akhir dengan judul "*Analisis Perbandingan Metode Peramalan Kuantitatif dengan Metode Peramalan Kualitatif dalam Penyusunan Anggaran Penjualan (Studi Kasus pada PT. Dami Sariwana Semarang)*".

Demikian surat keterangan ini dibuat untuk dapat dipergunakan dengan sebaik-baiknya.

Semarang, Januari 2000

tertanda,

Industri jamu

PT. DAMI SARIWANA
Semarang - Indonesia

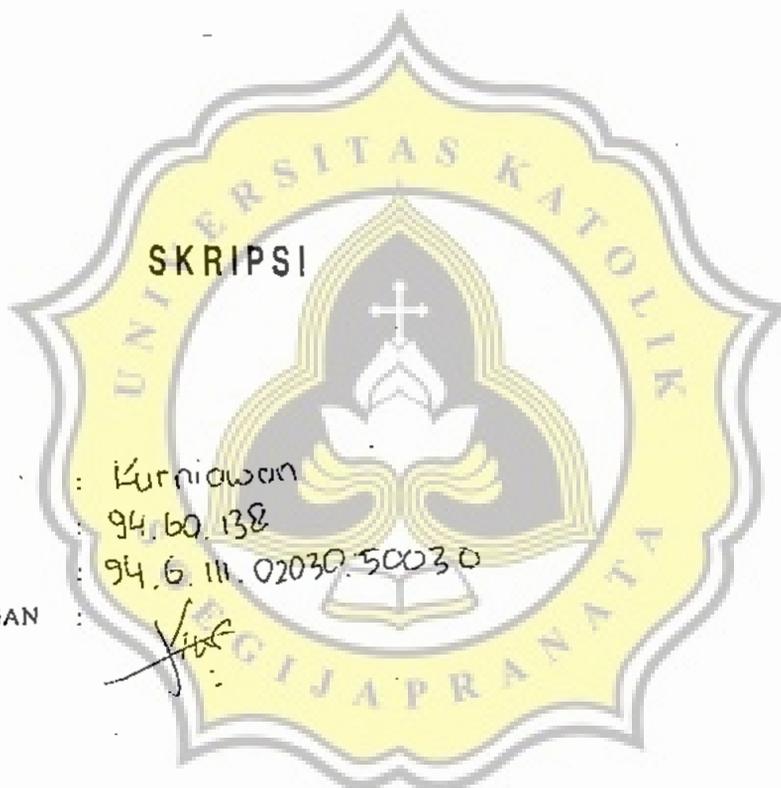
Yanu Ariyanto



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KOORDINATOR SKRIPSI

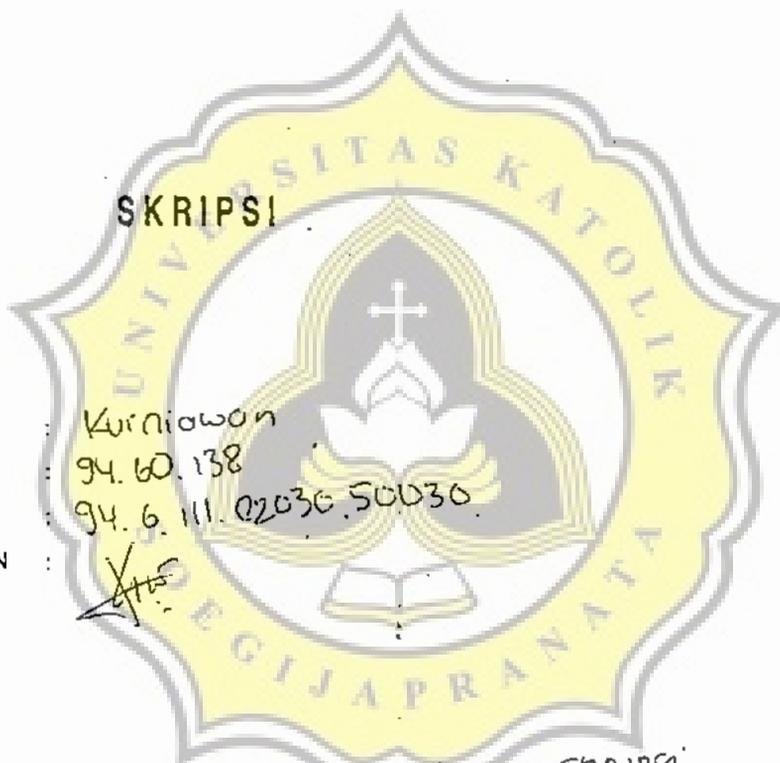
(Stephani Uly I, SE, MM)



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(Stepani Utj I, SE, MM)