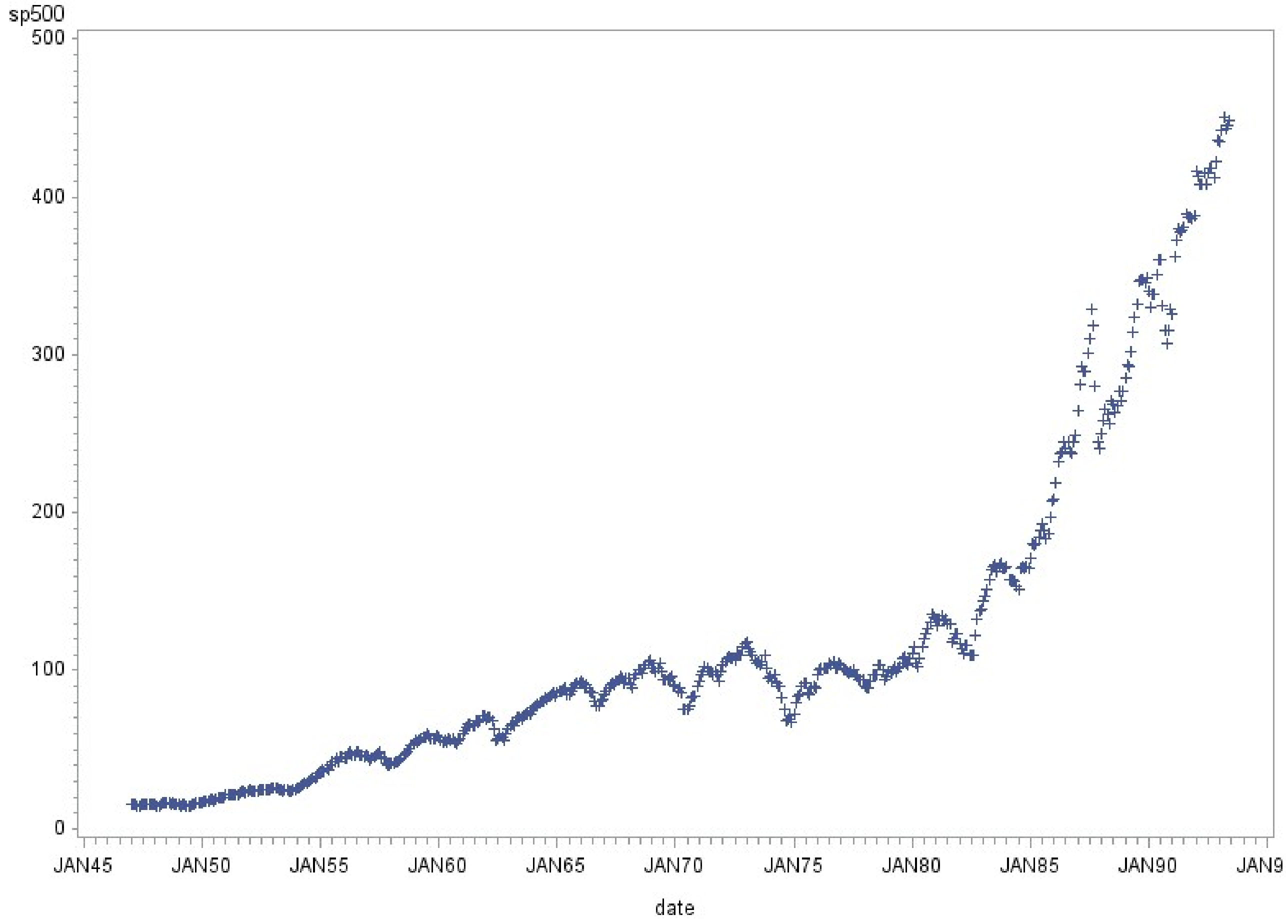
sp500
500
400
300
200
100
0
JAN45
JAN50
JAN55
JAN60
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JAN80
JAN85
JAN90
JAN95
date

The SAS System

The ARIMA Procedure

Name of Variable = sp500	
Period(s) of Differencing	1
Mean of Working Series	0.77711
Standard Deviation	5.156145
Number of Observations	557
Observation(s) eliminated by differencing	1

Autocorrelation Check for White Noise

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	63.42	6	<.0001	0.319	0.007	-0.085	-0.059	-0.021	0.023
12	76.67	12	<.0001	-0.001	-0.064	-0.033	0.039	0.110	-0.066
18	80.75	18	<.0001	0.026	0.008	-0.065	-0.037	-0.028	-0.001
24	88.98	24	<.0001	-0.044	-0.070	-0.015	0.028	-0.035	0.072

Extended Sample Autocorrelation Function

Lags	MA 0	MA 1	MA 2	MA 3	MA 4	MA 5	MA 6	MA 7	MA 8	MA 9	MA 10	MA 11	MA 12
AR 1	0.2995	0.0273	-0.0878	-0.0314	-0.0298	0.0221	-0.0016	-0.0677	-0.0340	0.0175	0.0759	-0.0151	0.0560
AR 2	-0.4377	0.0823	-0.0233	0.0336	-0.0457	-0.0114	-0.0100	-0.0314	0.0216	-0.0163	0.0734	0.0237	-0.0026
AR 3	-0.1550	-0.0702	0.0218	0.0249	-0.0430	0.0023	0.0132	-0.0205	-0.0058	-0.0025	0.0791	0.0189	-0.0041
AR 4	-0.3923	-0.0195	0.1441	0.0160	-0.0516	0.0050	0.0140	-0.0079	-0.0064	-0.0083	0.0649	-0.0590	0.0671
AR 5	0.1833	0.2948	-0.0219	-0.0835	-0.0750	-0.0467	-0.0147	-0.0181	0.0146	-0.0116	0.0355	-0.1038	0.0636
AR 6	0.4999	0.1799	-0.1182	-0.0598	-0.1946	-0.0477	0.0284	0.0011	0.0117	-0.0119	0.0090	-0.0774	-0.0412
AR 7	-0.3254	0.3621	-0.2627	0.1317	-0.2191	-0.0807	0.0253	-0.0017	-0.0021	-0.0146	-0.0063	-0.0741	0.0158
AR 8	0.2156	0.4766	0.3581	-0.0672	0.0581	0.0809	-0.0774	0.0196	0.0185	-0.0141	0.0019	-0.0439	-0.0190
AR 9	-0.2770	0.0885	0.2779	0.1008	0.0188	0.1376	-0.0346	0.0856	0.0087	-0.0672	0.0225	-0.1034	0.0069
AR 10	-0.4490	0.0719	0.2644	-0.0268	0.0548	0.1260	0.0510	-0.0071	-0.0231	-0.1620	0.0139	-0.0758	-0.0259
AR 11	0.4081	0.2701	0.0290	0.0158	0.1430	0.1419	0.0405	-0.0161	-0.0833	-0.0712	-0.0480	-0.2157	-0.0576
AR 12	0.4959	0.2619	-0.2496	-0.0025	0.1008	0.3103	-0.0303	-0.2249	-0.0179	0.1481	-0.0277	-0.0736	-0.0484

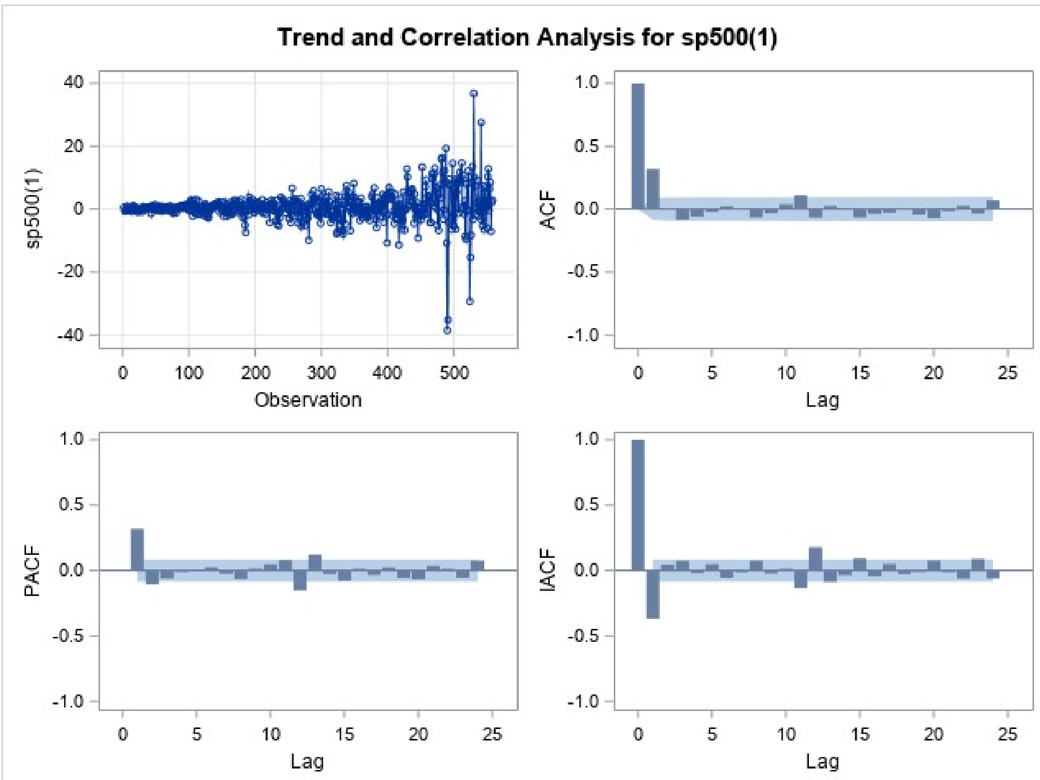
ESACF Probability Values

Lags	MA 0	MA 1	MA 2	MA 3	MA 4	MA 5	MA 6	MA 7	MA 8	MA 9	MA 10	MA 11	MA 12
AR 1	<.0001	0.5718	0.0518	0.4654	0.6024	0.6402	0.9720	0.1233	0.5522	0.6859	0.1801	0.7835	0.2144
AR 2	<.0001	0.0757	0.6132	0.5375	0.4251	0.8543	0.8328	0.5331	0.6979	0.7353	0.2068	0.7069	0.9657
AR 3	0.0003	0.0988	0.6102	0.5816	0.3883	0.9677	0.8107	0.7370	0.9227	0.9661	0.1693	0.7612	0.9466
AR 4	<.0001	0.6467	0.0014	0.7183	0.3173	0.9317	0.7725	0.8644	0.9180	0.8876	0.2742	0.2761	0.1697
AR 5	<.0001	<.0001	0.6455	0.0649	0.2731	0.3265	0.8050	0.7693	0.7742	0.8618	0.6435	0.0779	0.1980
AR 6	<.0001	0.0003	0.0099	0.2689	<.0001	0.3633	0.5466	0.9813	0.8325	0.8894	0.9203	0.1797	0.5281
AR 7	<.0001	<.0001	<.0001	0.0277	<.0001	0.1585	0.5856	0.9707	0.9651	0.8794	0.9478	0.2017	0.7675
AR 8	<.0001	<.0001	<.0001	0.1680	0.2701	0.1364	0.1814	0.7426	0.7713	0.8772	0.9829	0.4604	0.7592
AR 9	<.0001	0.1076	<.0001	0.1476	0.7108	0.0223	0.5951	0.1207	0.9106	0.3038	0.7771	0.0589	0.9002

AR 10	<.0001	0.1434	<.0001	0.6022	0.3186	0.1138	0.5997	0.9374	0.7640	0.0043	0.8414	0.1896	0.6610
AR 11	<.0001	<.0001	0.6526	0.8071	0.0452	0.1055	0.6658	0.8616	0.3276	0.3289	0.4927	<.0001	0.3823
AR 12	<.0001	<.0001	<.0001	0.9688	0.0733	<.0001	0.6193	0.0002	0.7672	0.0117	0.6353	0.2170	0.4547

ARMA(p+d,q) Tentative Order Selection Tests	
ESACF	
p+d	**q**
1	2
12	10

(5% Significance Level)



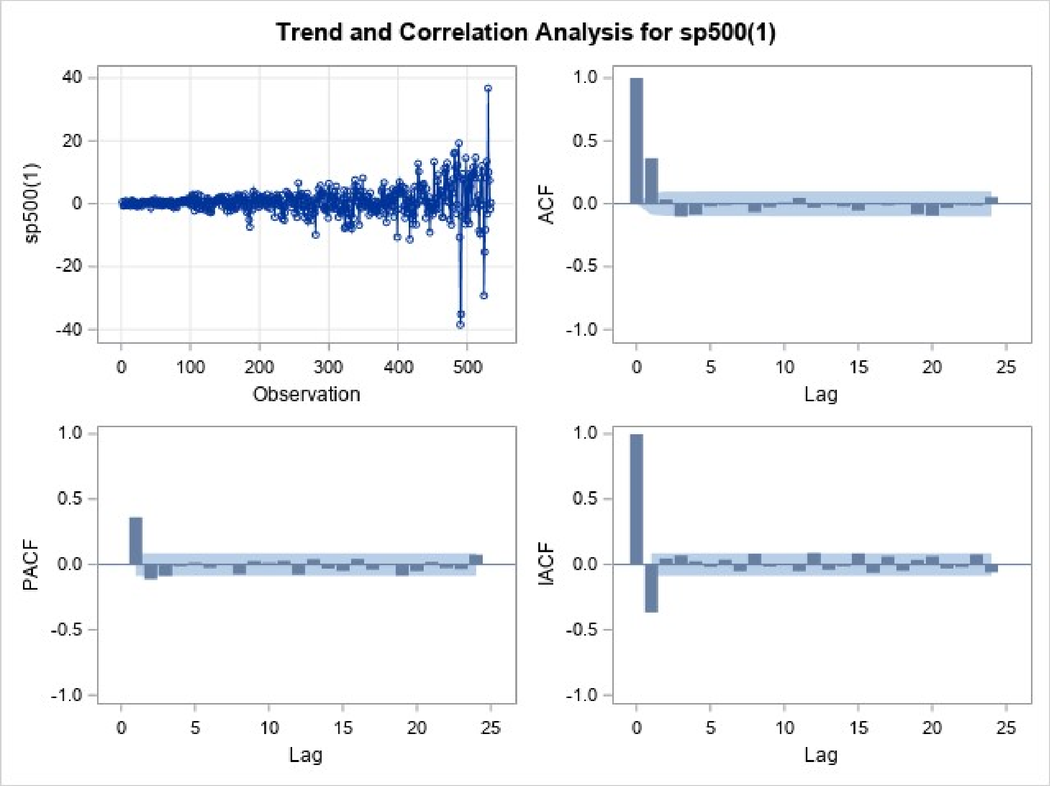
The SAS System

The ARIMA Procedure

Name of Variable = sp500	
Period(s) of Differencing	1
Mean of Working Series	0.681201
Standard Deviation	5.007287
Number of Observations	533
Observation(s) eliminated by differencing	1

Autocorrelation Check for White Noise

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	80.91	6	<.0001	0.362	0.033	-0.102	-0.086	-0.022	-0.011
12	85.40	12	<.0001	-0.005	-0.066	-0.027	0.011	0.047	-0.030
18	87.47	18	<.0001	-0.009	-0.023	-0.054	0.007	-0.013	-0.005
24	98.44	24	<.0001	-0.081	-0.094	-0.033	-0.011	-0.014	0.054



Maximum Likelihood Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
MU	0.68119	0.30424	2.24	0.0252	0
MA1,1	-0.40288	0.04318	-9.33	<.0001	1
MA1,2	-0.10805	0.04320	-2.50	0.0124	2

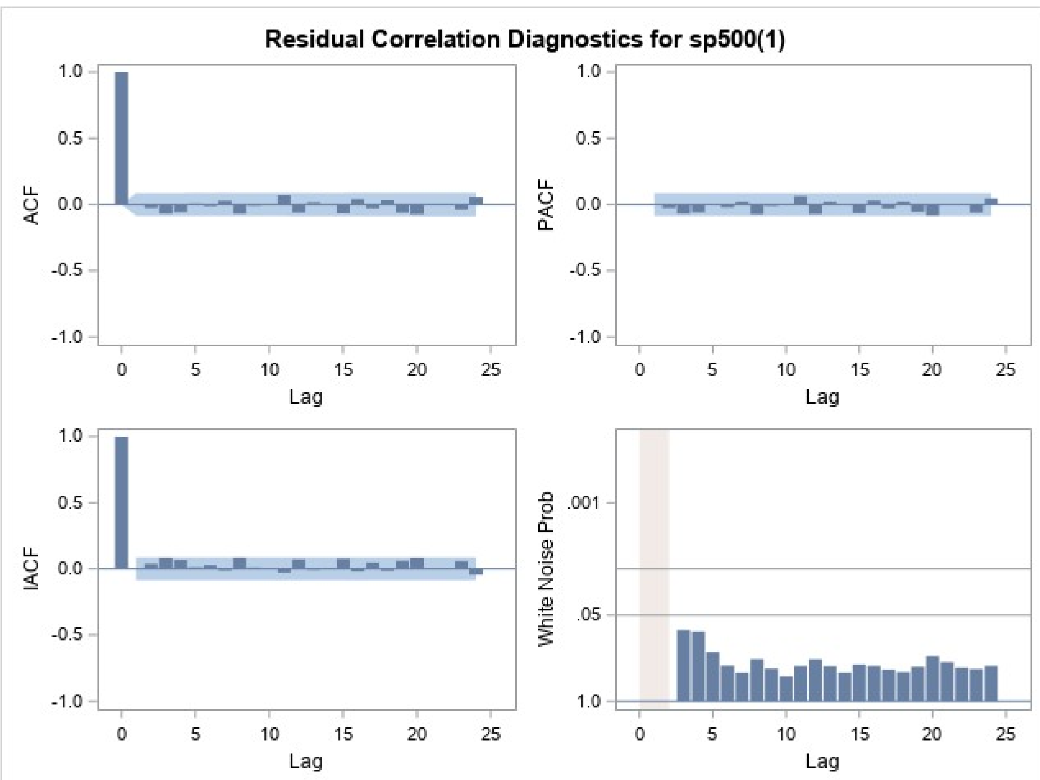
Constant Estimate	0.681191
Variance Estimate	21.64993
Std Error Estimate	4.652948
AIC	3154.721
SBC	3167.557
Number of Residuals	533

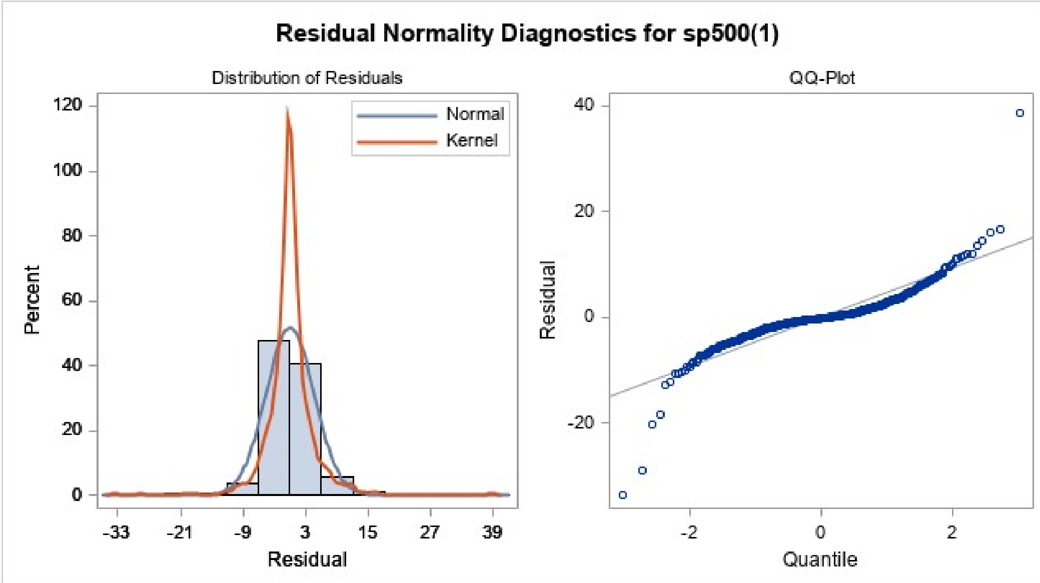
Correlations of Parameter Estimates

Parameter	MU	MA1,1	MA1,2
MU	1.000	-0.000	0.001
MA1,1	-0.000	1.000	0.362
MA1,2	0.001	0.362	1.000

Autocorrelation Check of Residuals

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	4.99	4	0.2886	-0.004	-0.025	-0.070	-0.059	0.009	-0.013
12	12.86	10	0.2315	0.027	-0.071	-0.009	0.001	0.069	-0.062
18	17.36	16	0.3628	0.015	-0.001	-0.067	0.040	-0.028	0.032
24	25.12	22	0.2914	-0.062	-0.074	0.003	0.004	-0.038	0.056
30	34.23	28	0.1935	0.011	0.082	0.077	0.058	0.003	-0.008
36	52.89	34	0.0205	-0.058	-0.040	0.037	0.143	0.073	-0.022
42	56.74	40	0.0416	-0.037	0.012	-0.063	-0.021	-0.011	0.025
48	62.44	46	0.0535	-0.010	0.035	0.025	-0.028	0.082	-0.015





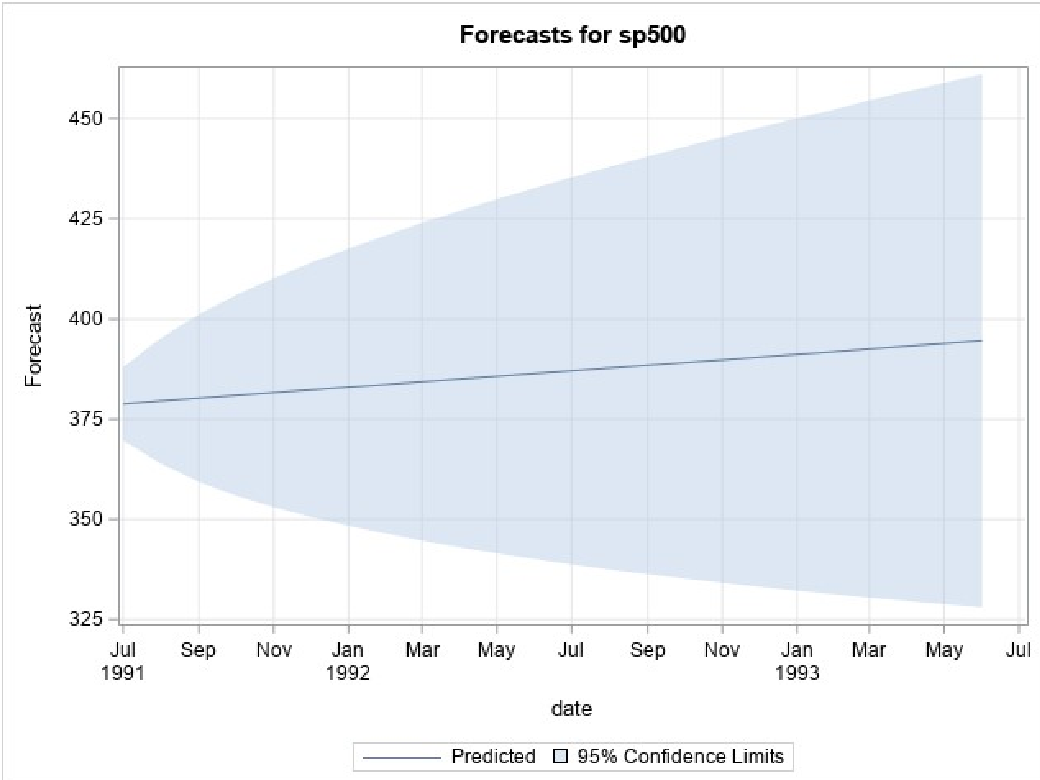
Model for variable sp500	
Estimated Mean	0.681191
Period(s) of Differencing	1

Moving Average Factors	
Factor 1:	1 + 0.40288 B**(1) + 0.10805 B**(2)

Forecasts for variable sp500

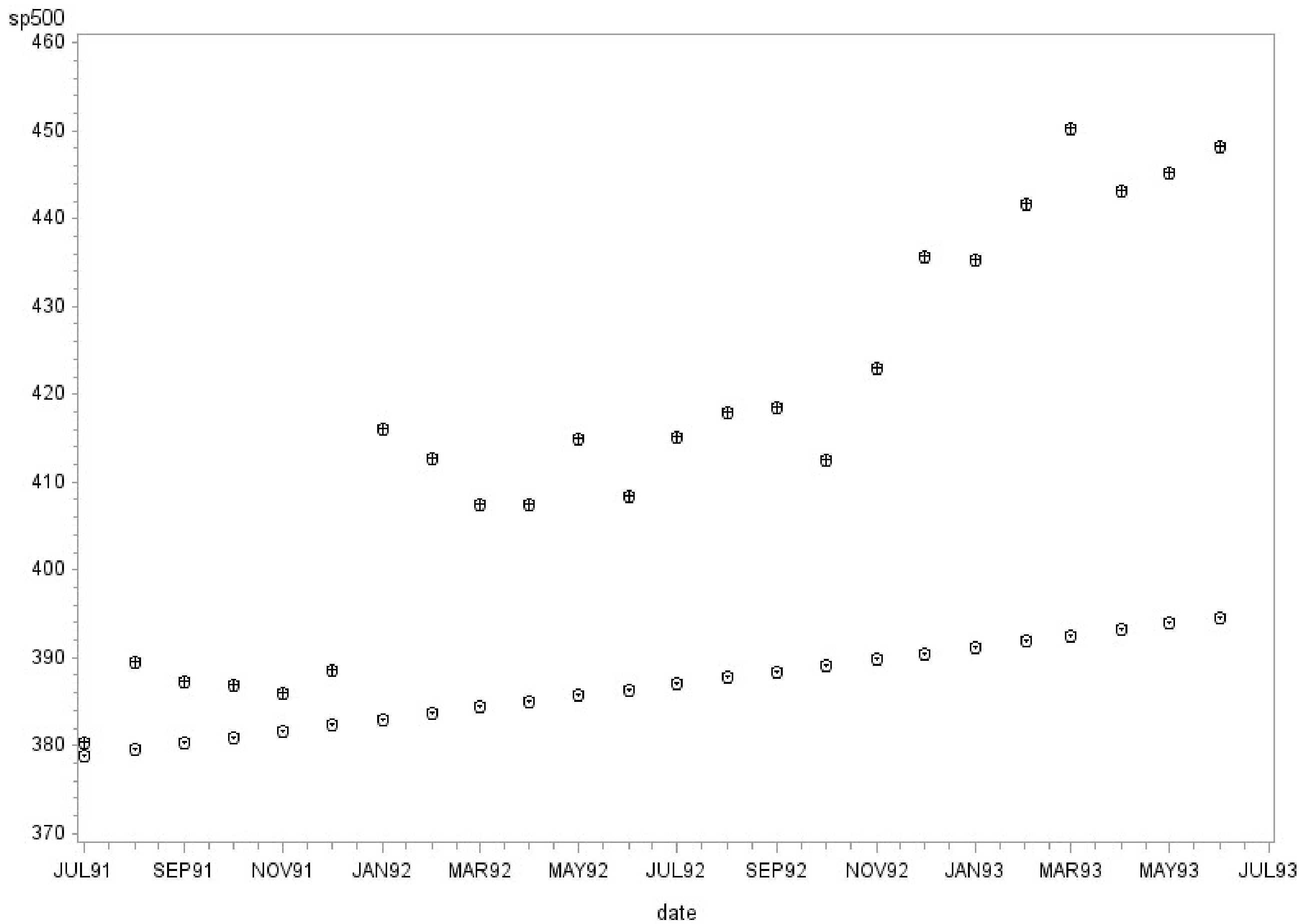
Obs	Forecast	Std Error	95% Confidence Limits	
535	378.8142	4.6529	369.6946	387.9338
536	379.5600	8.0161	363.8487	395.2714
537	380.2412	10.6622	359.3436	401.1388
538	380.9224	12.7714	355.8909	405.9538
539	381.6036	14.5785	353.0302	410.1770
540	382.2848	16.1851	350.5625	414.0070
541	382.9660	17.6460	348.3804	417.5516
542	383.6472	18.9949	346.4178	420.8766
543	384.3283	20.2542	344.6309	424.0258
544	385.0095	21.4396	342.9887	427.0304
545	385.6907	22.5629	341.4684	429.9131
546	386.3719	23.6328	340.0526	432.6913
547	387.0531	24.6563	338.7277	435.3785
548	387.7343	25.6390	337.4828	437.9858
549	388.4155	26.5854	336.3091	440.5219
550	389.0967	27.4992	335.1992	442.9941
551	389.7779	28.3836	334.1470	445.4088
552	390.4591	29.2413	333.1471	447.7711
553	391.1403	30.0746	332.1951	450.0854
554	391.8214	30.8854	331.2872	452.3557

555	392.5026	31.6754	330.4200	454.5853
556	393.1838	32.4462	329.5905	456.7772
557	393.8650	33.1991	328.7960	458.9341
558	394.5462	33.9353	328.0342	461.0582



The SAS System

Obs	date	sp500	FORECAST	STD	L95	U95	RESIDUAL
1	JUL91	380.33	378.814	4.6529	369.695	387.934	.
2	AUG91	389.40	379.560	8.0161	363.849	395.271	.
3	SEP91	387.20	380.241	10.6622	359.344	401.139	.
4	OCT91	386.88	380.922	12.7714	355.891	405.954	.
5	NOV91	385.92	381.604	14.5785	353.030	410.177	.
6	DEC91	388.51	382.285	16.1851	350.563	414.007	.
7	JAN92	416.08	382.966	17.6460	348.380	417.552	.
8	FEB92	412.56	383.647	18.9949	346.418	420.877	.
9	MAR92	407.36	384.328	20.2542	344.631	424.026	.
10	APR92	407.41	385.010	21.4396	342.989	427.030	.
11	MAY92	414.81	385.691	22.5629	341.468	429.913	.
12	JUN92	408.27	386.372	23.6328	340.053	432.691	.
13	JUL92	415.05	387.053	24.6563	338.728	435.379	.
14	AUG92	417.93	387.734	25.6390	337.483	437.986	.
15	SEP92	418.48	388.415	26.5854	336.309	440.522	.
16	OCT92	412.50	389.097	27.4992	335.199	442.994	.
17	NOV92	422.84	389.778	28.3836	334.147	445.409	.
18	DEC92	435.64	390.459	29.2413	333.147	447.771	.
19	JAN93	435.23	391.140	30.0746	332.195	450.085	.
20	FEB93	441.70	391.821	30.8854	331.287	452.356	.
21	MAR93	450.16	392.503	31.6754	330.420	454.585	.
22	APR93	443.08	393.184	32.4462	329.590	456.777	.
23	MAY93	445.25	393.865	33.1991	328.796	458.934	.
24	JUN93	448.06	394.546	33.9353	328.034	461.058	.


sp500
460
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MAY92
JUL92
SEP92
NOV92
JAN93
MAR93
MAY93
JUL93
date