**Stat 436**

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**Time series: W6**

**Time series plot:**

**PACF:**

**ACF: **

**Box-Cox plot:**

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**We get that lambda is 0.5 so we transform W6 to** $\sqrt{w6}$**,**

**Time series: **

**PACF: **

**ACF: **

**ARIMA Model: sqrt(W6)**

Estimates at each iteration

Iteration SSE Parameters

 0 150662 0.100 0.100

 1 77579 0.250 -0.050

 2 59482 0.400 0.038

 3 40532 0.550 0.121

 4 21911 0.700 0.191

 5 7389 0.850 0.260

 6 850 1.000 0.380

 7 816 1.001 0.530

 8 811 1.001 0.584

 9 811 1.001 0.595

 10 811 1.001 0.597

 11 811 1.001 0.598

Relative change in each estimate less than 0.0010

\* WARNING \* Back forecasts not dying out rapidly

Back forecasts (after differencing)

Lag -98 - -93 21.693 21.665 21.637 21.609 21.581 21.553

Lag -92 - -87 21.525 21.497 21.470 21.442 21.414 21.386

Lag -86 - -81 21.359 21.331 21.303 21.276 21.248 21.221

Lag -80 - -75 21.193 21.166 21.138 21.111 21.084 21.056

Lag -74 - -69 21.029 21.002 20.975 20.948 20.921 20.893

Lag -68 - -63 20.866 20.839 20.812 20.785 20.759 20.732

Lag -62 - -57 20.705 20.678 20.651 20.625 20.598 20.571

Lag -56 - -51 20.545 20.518 20.491 20.465 20.438 20.412

Lag -50 - -45 20.386 20.359 20.333 20.306 20.280 20.254

Lag -44 - -39 20.228 20.201 20.175 20.149 20.123 20.097

Lag -38 - -33 20.071 20.045 20.019 19.993 19.967 19.942

Lag -32 - -27 19.916 19.890 19.864 19.838 19.813 19.787

Lag -26 - -21 19.762 19.736 19.710 19.685 19.659 19.634

Lag -20 - -15 19.609 19.583 19.558 19.532 19.507 19.482

Lag -14 - -9 19.457 19.432 19.406 19.381 19.356 19.331

Lag -8 - -3 19.306 19.281 19.256 19.231 19.206 19.181

Lag -2 - 0 19.157 19.132 19.107

Back forecast residuals

Lag -98 - -93 -0.056 -0.090 -0.110 -0.122 -0.129 -0.133

Lag -92 - -87 -0.135 -0.137 -0.137 -0.138 -0.138 -0.138

Lag -86 - -81 -0.138 -0.138 -0.138 -0.137 -0.137 -0.137

Lag -80 - -75 -0.137 -0.137 -0.137 -0.136 -0.136 -0.136

Lag -74 - -69 -0.136 -0.136 -0.135 -0.135 -0.135 -0.135

Lag -68 - -63 -0.135 -0.135 -0.134 -0.134 -0.134 -0.134

Lag -62 - -57 -0.134 -0.134 -0.133 -0.133 -0.133 -0.133

Lag -56 - -51 -0.133 -0.133 -0.132 -0.132 -0.132 -0.132

Lag -50 - -45 -0.132 -0.132 -0.131 -0.131 -0.131 -0.131

Lag -44 - -39 -0.131 -0.130 -0.130 -0.130 -0.130 -0.130

Lag -38 - -33 -0.130 -0.129 -0.129 -0.129 -0.129 -0.129

Lag -32 - -27 -0.129 -0.128 -0.128 -0.128 -0.128 -0.128

Lag -26 - -21 -0.128 -0.127 -0.127 -0.127 -0.127 -0.127

Lag -20 - -15 -0.127 -0.126 -0.126 -0.126 -0.126 -0.126

Lag -14 - -9 -0.126 -0.126 -0.125 -0.125 -0.125 -0.125

Lag -8 - -3 -0.125 -0.125 -0.124 -0.124 -0.124 -0.124

Lag -2 - 0 -0.124 -0.124 -0.123

Final Estimates of Parameters

Type Coef SE Coef T P

AR 1 1.0013 0.0029 340.40 0.000<0.05

MA 1 0.5976 0.0798 7.49 0.000<0.05

Number of observations: 114

Residuals: SS = 808.834 (backforecasts excluded)

 MS = 7.222 DF = 112

Modified Box-Pierce (Ljung-Box) Chi-Square statistic

Lag 12 24 36 48

Chi-Square 6.3 12.7 24.5 39.2

DF 10 22 34 46

P-Value 0.789 0.942 0.885 0.750

As we can see, the p-value’s are greater than 0.05

ARIMA(1,0,1) which is ARMA(1,1)

$$\left(1-1.0013B\right)\dot{Z}\_{t}=(1-0.5976B)a\_{t}$$



 

