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CVG

NEC

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$$f(t+h) = \frac{\sum_{i=t-n+1}^t Z_i}{n} \quad (MA)$$

$$\varphi_p(L^p)Z_{ti} = \theta_q(L^q)\varepsilon_i \quad (q, p)$$

:(Richardson, 2005)

$$S_t = \alpha z_{t-1} + (1-\alpha)S_{t-1} \quad 0 < \alpha < 1$$

$$S_t = \alpha z_t + (1-\alpha)S_{t-1} \quad (t=1, 2, K, n) \quad (SBC)$$

(Natrella, (MSE) .2006)

(Richardson, .2005) .(Godjarati, 1995) ARIMA (p, d, q)

:(Richardson, 2005)

$$S_t = \alpha z_t + (1-\alpha)(S_{t-1} + T_{t-1}) \quad 0 < \alpha < 1$$

$$T_t = \beta (S_t - S_{t-1}) + (1-\beta)T_{t-1} \quad 0 < \beta < 1$$

$$T_t = \beta \alpha \quad (Richardson, 2005)$$

6. Sigel exponential smoothing method
7. Mean Square Error (MSE)
8. Double exponential smoothing method
9. Level of Data

1. Box and Pierce
2. White noise
3. Schwarz Bayesian Criterion
4. Moving Average
5. Exponential smoothing method

(MGN)

$\beta \quad \alpha$

(MSE)

(Tkacz, 2001)

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$k \quad z_t$

$$\begin{aligned} & e_{2,t} \quad e_{1,t} \\ & (s_t) \\ & () \quad () \quad (d_t) \end{aligned}$$

$$F_{n+k} = S_n + KT_n \quad ($$

$$\begin{aligned} s_t &= e_{\gamma,t} + e_{\nu,t} \quad (\\ d_t &= e_{\gamma,t} - e_{\nu,t} \quad (\end{aligned}$$

$k \quad F_{n+k} \quad z_t$

ARMIA

MGN

(Diebold & Mariano,

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:1995)

ARIMA

$$MGN = \frac{\hat{\rho}_{sd}}{\sqrt{\frac{1-\hat{\rho}_{sd}}{T-1}}}$$

$$T \quad d_t \quad s_t \quad \hat{\rho}_{sd}$$

(RMSE)

MAE RMSE
MGN

MPAE

(MPAE)

(MAE)

:(Holden et al., 1990)

$$RMSE = \sqrt{\frac{1}{n} \sum_{t=1}^n e_t^2} \quad ($$

$$MAE = \frac{1}{n} \sum_{t=1}^n |e_t| \quad ($$

$$MPAE = \left(\frac{1}{n} \sum_{t=1}^n \left| \frac{e_t}{Z_t} \right| \right) \times 100 \quad ($$

(FAO)

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RMSE

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- 6. Morgan-Granger-Newbold (MGN)
 - 7. Augmented Dickey–Fuller (ADF)

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- 1. K steps a head forecasting
 - 2. Root of Mean Square Error (RMSE)
 - 3. Mean Absolute Error (MAE)
 - 4. Mean Percent Absolute Error (MPAE)
 - 5. Theil U Statistic

MPAE MAE RMSE
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 MPAE
 ARIMA
 () ARIMA
 MPAE / /
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 ARIMA

MPAE(%)	MAE	RMSE
/		ARIMA (2, 2, 1)
/		ARIMA (2, 1, 2)
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/		
/		ARIMA (3, 1, 3)

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MGN	MPAE(%)
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(Shabani, 2008; The Centre of Iran's
.Mechanization Dev.)

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/(FAO, 2008)

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