

Results are obtained with h_0^P estimated

| CALIBRATED PARAMETERS ON WEDNESDAYS WRT MSE, $h_0^Q = \frac{\omega_0 + \alpha_0}{1 - \beta_0 - \alpha_0 \gamma_0^2}$, WITH $\omega_0, \alpha_0, \beta_0, \gamma_0^{*2}$ FROM MLE UNDER P AND UPDATED UNDER Q | | | | | | | | | |
|---|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| θ | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| ω | $1.5697e-07$ | $5.7491e-06$ | $2.1523e-07$ | $2.7628e-07$ | $2.3732e-08$ | $1.6110e-08$ | $2.0066e-07$ | $1.2489e-08$ | $2.2192e-07$ |
| std | $(5.6788e-07)$ | $(1.6332e-05)$ | $(6.2554e-07)$ | $(7.5402e-07)$ | $(1.1658e-07)$ | $(1.1044e-07)$ | $(1.2615e-06)$ | $(6.3331e-08)$ | $(7.7929e-07)$ |
| ci | $(\pm 1.5653e-07)$ | $(\pm 4.5016e-06)$ | $(\pm 1.7415e-07)$ | $(\pm 2.1207e-07)$ | $(\pm 3.2133e-08)$ | $(\pm 3.0441e-08)$ | $(\pm 3.4772e-07)$ | $(\pm 1.7631e-08)$ | $(\pm 2.1695e-07)$ |
| median | $2.4090e-09$ | $5.6395e-09$ | $1.1196e-09$ | $5.4495e-10$ | $1.5386e-10$ | $2.2787e-10$ | $2.9269e-10$ | $8.1035e-11$ | $4.0877e-10$ |
| α | $1.4628e-05$ | $1.0156e-05$ | $9.7869e-06$ | $7.8367e-06$ | $7.9205e-06$ | $9.5198e-06$ | $8.2525e-06$ | $5.0611e-06$ | $9.1095e-06$ |
| std | $(1.0156e-05)$ | $(9.5801e-06)$ | $(8.8243e-06)$ | $(7.6776e-06)$ | $(5.5364e-06)$ | $(3.9620e-06)$ | $(5.2317e-06)$ | $(3.5988e-06)$ | $(6.2168e-06)$ |
| ci | $(\pm 2.7995e-06)$ | $(\pm 2.6406e-06)$ | $(\pm 2.4567e-06)$ | $(\pm 2.1594e-06)$ | $(\pm 1.5260e-06)$ | $(\pm 1.0921e-06)$ | $(\pm 1.4420e-06)$ | $(\pm 1.0019e-06)$ | $(\pm 1.7308e-06)$ |
| median | $1.2294e-05$ | $8.0906e-06$ | $6.2118e-06$ | $5.0339e-06$ | $7.3727e-06$ | $8.4912e-06$ | $8.3068e-06$ | $4.6738e-06$ | $8.1628e-06$ |
| β | 0.5256 | 0.2930 | 0.4448 | 0.4003 | 0.2776 | 0.1191 | 0.2523 | 0.1647 | 0.1895 |
| std | (0.2334) | (0.3055) | (0.2970) | (0.3662) | (0.3251) | (0.1824) | (0.2875) | (0.2930) | (0.2762) |
| ci | (± 0.0643) | (± 0.0842) | (± 0.0827) | (± 0.1030) | (± 0.0896) | (± 0.0503) | (± 0.0792) | (± 0.0816) | (± 0.0769) |
| median | 0.5544 | 0.1561 | 0.5631 | 0.4126 | 0.0787 | 0.0000 | 0.0087 | 0.0000 | 0.0004 |
| γ^* | 206.9885 | 393.3237 | 321.9917 | 420.5704 | 386.1910 | 300.0024 | 317.9679 | 464.4275 | 343.7525 |
| std | (168.6065) | (361.2128) | (294.8291) | (320.3050) | (252.4873) | (61.9570) | (103.3799) | (201.6139) | (242.9145) |
| ci | (± 46.4737) | (± 99.5626) | (± 82.0809) | (± 90.0872) | (± 69.5941) | (± 17.0775) | (± 28.4950) | (± 56.1297) | (± 67.6278) |
| median | 159.3995 | 245.4392 | 231.7922 | 268.0011 | 280.0996 | 301.5505 | 301.4061 | 413.2763 | 289.4503 |
| $h_0^Q = h_t^P$ | $1.2504e-04$ | $1.6094e-04$ | $8.8020e-05$ | $6.3516e-05$ | $6.4968e-05$ | $1.0677e-04$ | $9.4593e-05$ | $4.2065e-05$ | $1.2042e-04$ |
| std | $(8.4350e-05)$ | $(1.0127e-04)$ | $(3.9993e-05)$ | $(3.0169e-05)$ | $(3.7802e-05)$ | $(5.3934e-05)$ | $(6.6163e-05)$ | $(2.5624e-05)$ | $(9.2499e-05)$ |
| ci | $(\pm 2.3250e-05)$ | $(\pm 2.7914e-05)$ | $(\pm 1.1134e-05)$ | $(\pm 8.4851e-06)$ | $(\pm 1.0419e-05)$ | $(\pm 1.4866e-05)$ | $(\pm 1.8237e-05)$ | $(\pm 7.1338e-06)$ | $(\pm 2.5752e-05)$ |
| median | $1.0398e-04$ | $1.3887e-04$ | $7.9893e-05$ | $5.2671e-05$ | $5.4472e-05$ | $8.9209e-05$ | $6.9330e-05$ | $3.6036e-05$ | $1.0226e-04$ |
| MSE | 0.5696 | 2.7958 | 0.9089 | 1.1220 | 2.1939 | 2.3500 | 4.2735 | 8.5872 | 5.6765 |
| IVRMSE | 0.0956 | 0.1252 | 0.1365 | 0.1235 | 0.1280 | 0.1337 | 0.1460 | 0.1724 | 0.1401 |
| MAPE | 0.1199 | 0.1306 | 0.1811 | 0.1706 | 0.2157 | 0.2114 | 0.2289 | 0.3632 | 0.2216 |
| OptLL | 199.1370 | 198.2037 | 232.4967 | 308.1413 | 325.3681 | 406.4867 | 478.1218 | 511.1234 | 629.4424 |