

# ID7

## ARMA Identification



### 7.2 ARMA PREDICTORS



The optimal one-step-ahead ARMA predictor can be directly deduced from the ARMAX predictor or directly from (7.1.1) imposing a prediction error equal to  $w(t)$ . We obtain

$$y(t|t-1) = (\alpha_n + \gamma_n) y(t-1) + \dots + (\alpha_1 + \gamma_1) y(t-n) - \gamma_n y(t-1|t-2) - \dots - \gamma_1 y(t-n|t-n-1) \quad (7.2.1)$$

or equivalently, in forward notation,

$$r(z) y(t|t-1) = (r(z) - q(z)) y(t) \quad (7.2.2)$$

$$y(t|t-1) = \frac{(r(z) - q(z))}{r(z)} y(t). \quad (7.2.3)$$

ARMA predictors, like ARMAX ones, are subject to stability conditions linked to the confinement of all zeros of  $r(z)$  inside the unit circle.

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