Materials 20 - Optimal Taylor rule coefficients

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I solve for the optimal Taylor-rule coefficients in the anchoring model by obtaining the optimal noninertial plan for the endogenous variables and performing coefficient-comparison on (**??**).[1] The noninertial plan entails linear responses to exogenous disturbances of the form $z_t = \bar{z} + f_z u_t + g_z r_t^n$ where $z = \{\pi, x, i, f_a, f_b, \bar{\pi}, k^{-1}\}$. I obtain the optimal responses to disturbances f_z, g_z by having them minimize the part of the central bank's loss function, Equation (**??**), that pertains to losses from variance in the endogenous variables, subject to the conjectures satisfying the model equations (1) - (6).

$$\pi_t - \kappa x_t - (1-\alpha)\beta f_a(t) - \kappa\alpha\beta b_2(I_3 - \alpha\beta h_x)^{-1} s_t - e_3(I_3 - \alpha\beta h_x)^{-1} s_t = 0 \tag{1}$$

$$x_t + \sigma i_t - \sigma f_b(t) - (1-\beta) b_2 (I_3 - \beta h_x)^{-1} s_t + \sigma\beta b_3 (I_3 - \beta h_x)^{-1} s_t - \sigma e_1 (I_3 - \beta h_x)^{-1} s_t \big) = 0 \tag{2}$$

$$f_a(t) - \frac{1}{1-\alpha\beta}\bar{\pi}_{t-1} - b_1(I_3 - \alpha\beta h_x)^{-1} s_t = 0 \tag{3}$$

$$f_b(t) - \frac{1}{1-\beta}\bar{\pi}_{t-1} - b_1(I_3 - \beta h_x)^{-1} s_t = 0 \tag{4}$$

$$\bar{\pi}_t - \bar{\pi}_{t-1} - k_t^{-1}\big(\pi_t - (\bar{\pi}_{t-1} + b_1 s_{t-1})\big) = 0 \tag{5}$$

$$k_t^{-1} - f(\pi_t - \bar{\pi}_{t-1} - b_1 s_{t-1}) = 0 \tag{6}$$

[1] For the specifics of the optimal noninertial plan, see **?**.