

Materials 22 - GMM of simple anchoring function

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1 Specifications of anchoring function and estimation

- Anchoring function

$$k_t = k_{t+1} + \frac{1}{(d fe)^2} \quad (1)$$

Recall agents update their PLM using the inverse gain k_t^{-1} . This means that the bigger $\frac{1}{(d fe)^2}$, the more the gain is *decreasing*. Thus higher forecast errors fe or a higher d means closer to constant gains.

- Target: I gather the time series of inflation, output gap and federal funds rate, filter them, and compute empirical autocovariances:

$$ac^{data}(h) \equiv \text{cov}(y_t, y_{t-h}) \quad (2)$$

for $h = 0, \dots, K$, selecting $K = 4$. I gather these autocovariances for the three variables in the matrix AC . The target then is $ac^{data} \equiv \text{vec}(AC)$ (a $n_y(K+1) \times 1$ vector, i.e. 15×1). Thus the objective function can be written as:

$$J \equiv (ac^{data} - ac^{model})' W^{-1} (ac^{data} - ac^{model}) \quad (3)$$

- Initial $d_0 = 10$.

2 Estimation issues

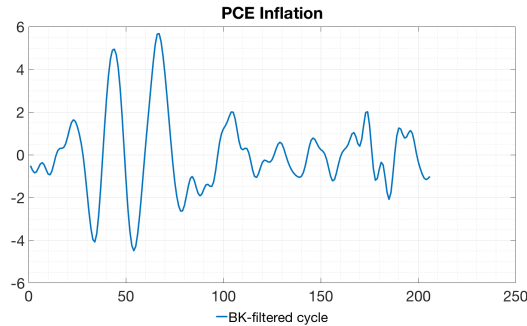
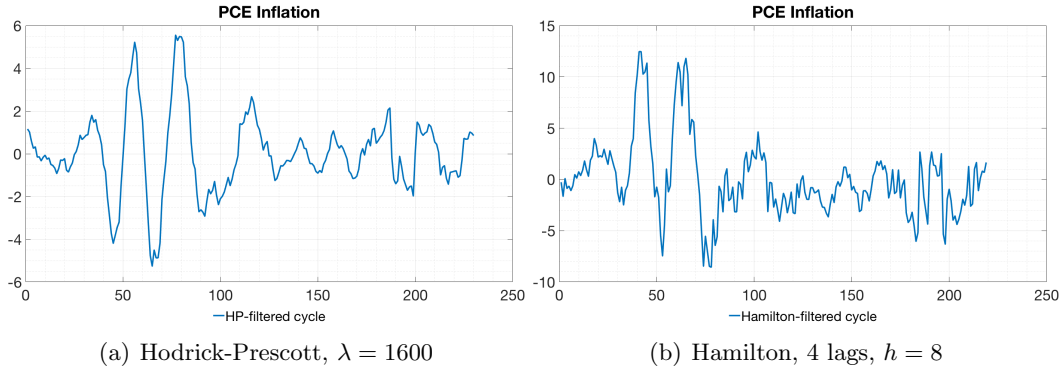
- W : Ideally I'd want to use a weighting matrix with the estimated variances of the target moments on the diagonal:

$$W = \begin{pmatrix} \hat{\sigma}_{ac(\pi,0)}^2 & 0 & \dots & 0 \\ 0 & \hat{\sigma}_{ac(x,0)}^2 & 0 & \dots & 0 \\ \vdots & & \ddots & & \vdots \\ 0 & \dots & 0 & \hat{\sigma}_{ac(i,K)}^2 \end{pmatrix} \quad (4)$$

Since I haven't fitted the data to any time series process, I create bootstrapped samples from the original (filtered) data. This however results in tiny bootstrapped variances, so W^{-1} is huge, wherefore the estimation doesn't move from my prior of d_0 .

3 Robustness to different filters

Figure 1: Cyclical component of inflation filtered using different methods



4 Estimates

Figure 2: Inverse gain for \hat{d} for the different filters

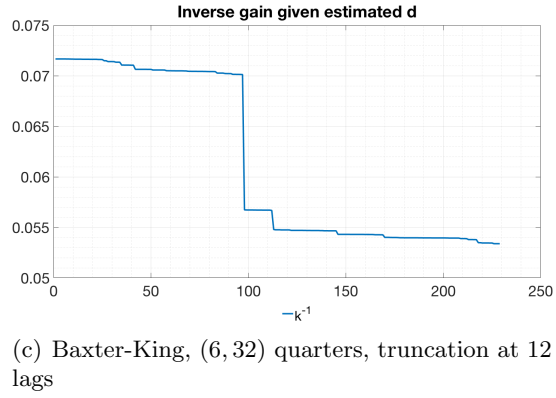
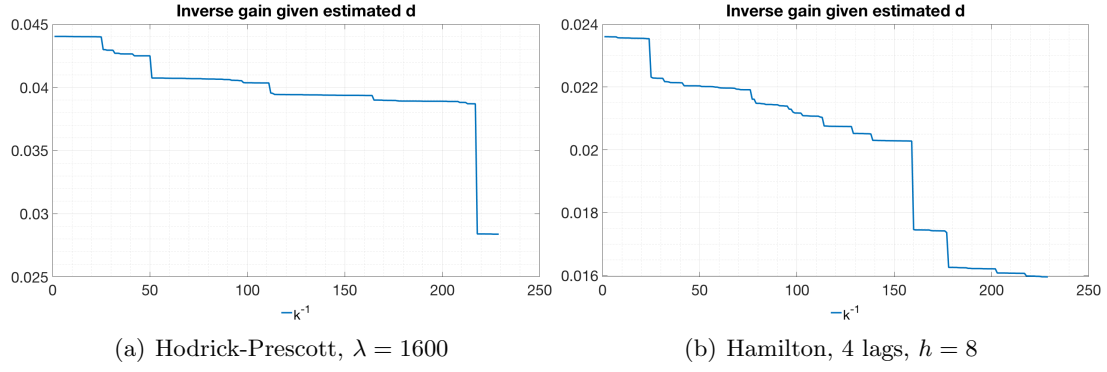


Table 1: \hat{d}

	$W = I$	$W = \text{diag}(\hat{\sigma}_{ac(0)}, \dots, \hat{\sigma}_{ac(K)})$
HP	77.7899	10
Hamilton	32.1649	10
BK	90.3929	10