A Final Problem

May 2020

1 Taylor Wage-Setting

Here you will enter and solve the simple wage-setting model à la Taylor presented in Sims (2002). The equations are as follows:

$$w_t = \frac{1}{3}\mathbb{E}_t\left[W_t + W_{t+1} + W_{t+2}\right] - \alpha(u_t - u^*) + v_t \tag{1}$$

$$W_t = \frac{1}{3}\left[w_t + w_{t-1} + w_{t-2}\right] \tag{2}$$

$$u_t = \theta u_{t-1} + \gamma W_t + \mu + \epsilon_t \tag{3}$$

$$v_t \sim \mathcal{N}(0, \sigma_v^2) \tag{4}$$

$$\epsilon_t \sim \mathcal{N}(0, \sigma_\epsilon^2). \tag{5}$$

Here, u, w, and W are endogenous variables while ϵ and v are exogenous white noise processes. We have seven parameters to estimate: $[\alpha, u^*, \theta, \gamma, \mu, \sigma_v, \sigma_\epsilon]$.

We have data from this model, but don't know the values of the parameters. We have the following priors for the parameters.

	Prior		
	Dist.	Mean	Stdev.
α	Normal	0.8	0.1
u^*	Beta	0.05	0.125
θ	Normal	0.8	0.1
γ	Normal	0.5	0.1
μ	Normal	1.5	0.3
σ_v	Inv. Gamma	0.15	0.7
σ_ϵ	Inv. Gamma	0.15	0.7

A.

Given that this is a model of wage-setting, what could each of these equations mean? What could the shocks ϵ and v represent?

B.

Given the equations, parameters, and priors fill in the blanks of `tm_322f_s20.mod`. In this file, our variables are `w` (w), `bw` (W), `u` (u), `vee` (v), and `eps` (ϵ). The parameters that show up in the model are `alpha` (α),

`ustar` (u^*), `theta` (θ), `gamma` (γ), `mu` (μ), `stderr vee` (σ_v), and `stderr eps` (σ_ϵ).

C.

Estimate the model. Comment on how the posteriors differ from the priors. Comment on what you see in the impulse responses. How may we interpret them?

2 Code