

PS5 2025 (Week 6) - Questions

Due before class Week 7 (28 October 2025)

This session is based on the work of Christoffel and Kuester (both of the European central bank) in their 2008 paper, “Resuscitating the wage channel in models with unemployment fluctuations”, *Journal of Monetary Economics*, vol.55, pp. 865-887, in which they estimate a DSGE model which attempts to account for unemployment fluctuations. This is a much more complex model than any we have looked at so far, but not beyond your capacity!

1. Read carefully the first three sections of the paper, so that you understand clearly what they do and why; pay special attention to Table 1 which explains the parameters and their initial calibration, and Table 2 which gives the steady-state values. Then use the attached Dynare mod-file (which was originally written by one of the authors, Kuester, and which I have adapted slightly, adding Tex elements), entitled “CK08_simRTM.mod” to simulate the “Right to Manage (RTM)” version of the model and compare your results to those published in the paper, in particular Table 2.
2. Re-do Q1 using the two alternative values for γ ($1/2$ and $11/12$ - see section 4.2) and attempt to reproduce Figure 1, commenting on your results. To do so, you may use the attached Matlab file “CK08_Fig1_2025.m”; note that doing so requires that the accompanying Matlab file “plot_comp.m” be in the same directory. Note that the time period for this model (and hence the IRFs) is in *months*, not *quarters*.
3. Re-do Q1 but using the “Efficient Bargaining” version of the model “CK08_simEB.mod” (see Appendix A.3). Attempt to replicate Figure 2, using “CK08_Fig1_2025.m” as a guide, and commenting on your results.
4. Attempt to reproduce Figure 4 using “CK08_Fig1_2025.m” as a guide. Note that there is an error in the authors’ indications under Figure 4: for $A = 10$, it is necessary to set $\Phi_y = 0.008182$, and NOT to 0.0087 as they indicate. [Further, for $A = 17.92$, Φ_y must be set = 0.00863; this is the setting I have included in CK08_simRTM.mod.] Comment on your results.
5. Next, using the dataset you prepared for the SW2007 model, construct an appropriate data-file for estimation of the CK08 by using the “Transformed

data” part, **from 1965Q1 until 2024Q4**. The first four columns of this part will (should!) contain transformed variables which are logs of the underlying real per capita variables (consumption, investment, output and hours), the remaining three columns relating to the inflation, wage and interest rates. You should therefore have seven new variables, naming them “c i y h pi rw r” respectively. Since the model variables (ex inflation and interest rates) are in terms of log deviations from the steady state, you will need to detrend the c, i, y, h and rw variables. Do **not** use the differences of these variables (as you did for SW). Instead, use the **one-sided HP filter** to construct the necessary detrended observations for these model variables. To do so, you may use the attached small Matlab file “HP1side_filter2025.m” **as the datafile** in your model. Be sure that you understand what that Matlab file does and adapt it to your specific case!

6. Using observations **1977Q1 to 2018Q4** inclusive, estimate the parameters of the model by Regularised MLE using the mod-file entitled “CK08_estRTM.mod”. Note that in this mod-file I have made some adjustments to take account of the fact that the original model was measured in *months*, but the data is *quarterly*. Comment on your results, with particular attention to the “deep” parameters, comparing them to those calibrated by Christoffel and Kuester.
7. What happens if you substitute “labobs” for “robs” in your estimation?
8. Re-estimate the model of Q6 by full Bayes (ie, incorporating also RW-MH, using mh_replic=20000), and compare your results with those in Q6 above.