Problem Set 2 ECON8861

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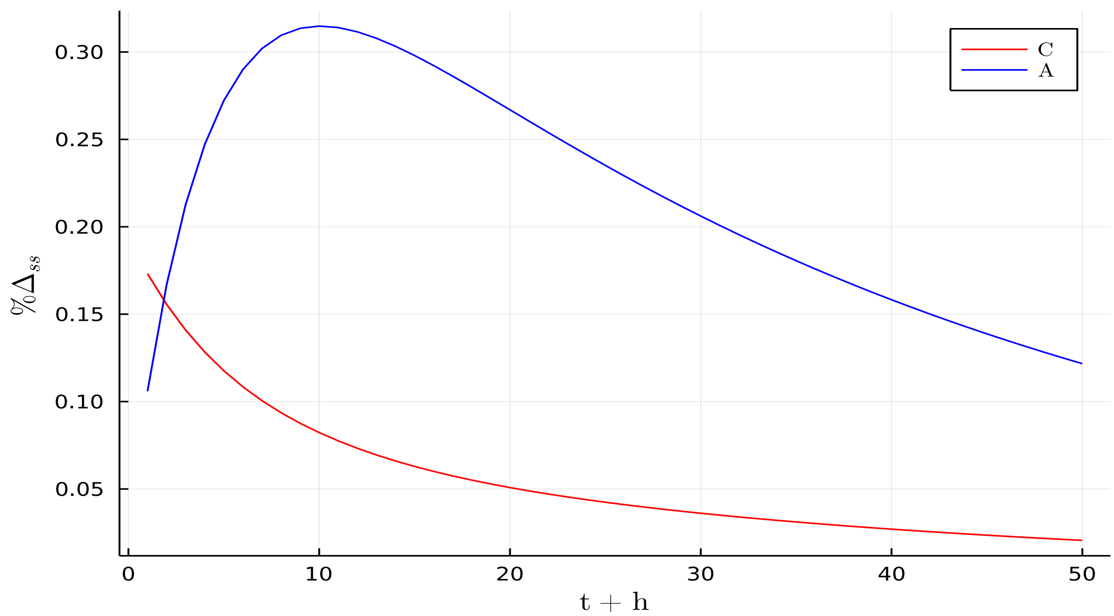
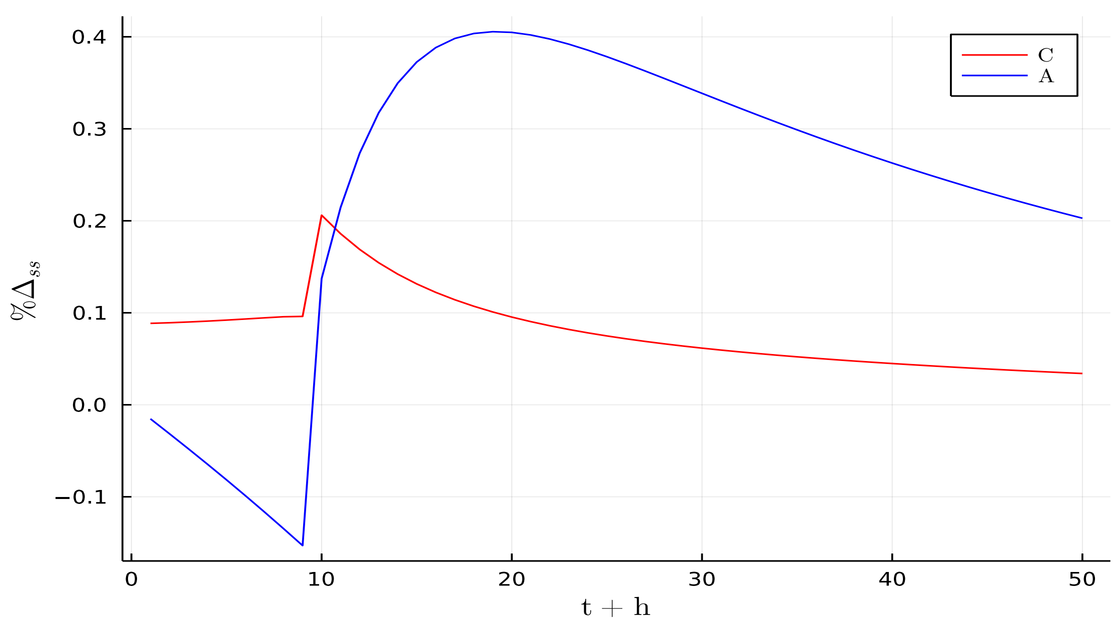
1. The impulse responses to the two different MIT-shocks are



(a) Unanticipated Shock



(b) News Shock

The truncation horizon T does not affect the shape of the impulse response functions. To assess it, I simulate the model for 91 iterations spanning from $T = 100$ to $T = 1000$ and compute the variance across simulations. If the variance is (up to a given tolerance) zero, it means there is no change in the IRFs.

2. To find the market-clearing β in the Hugget model, from

$$A(r, \beta_0, (1-\tau)Y, \underline{a}, \sigma_\epsilon) = B$$

where β_0 is the root of the equation $A(r, \beta^{(t)}, (1-\tau)Y, \underline{a}, \sigma_\epsilon) - B = 0$ in which $\beta^{(t)}$ is the candidate in the iterative root-finding algorithm. W exploit homoteticity and rewrite the market-clearing condition as

$$A(r, \beta^{(t)}, 1, \underline{a}, \sigma_\epsilon) = \frac{B/Y}{1-\tau}.$$

We use a root-finding bracketing method, referring to the intermediate value theorem. To initiate the algorithm with a lower and upper bound, we conduct a naive grid search to plot the error function over a range ($[0.975, 0.995]$) of possible values for β_0 The root found using the above-mentioned

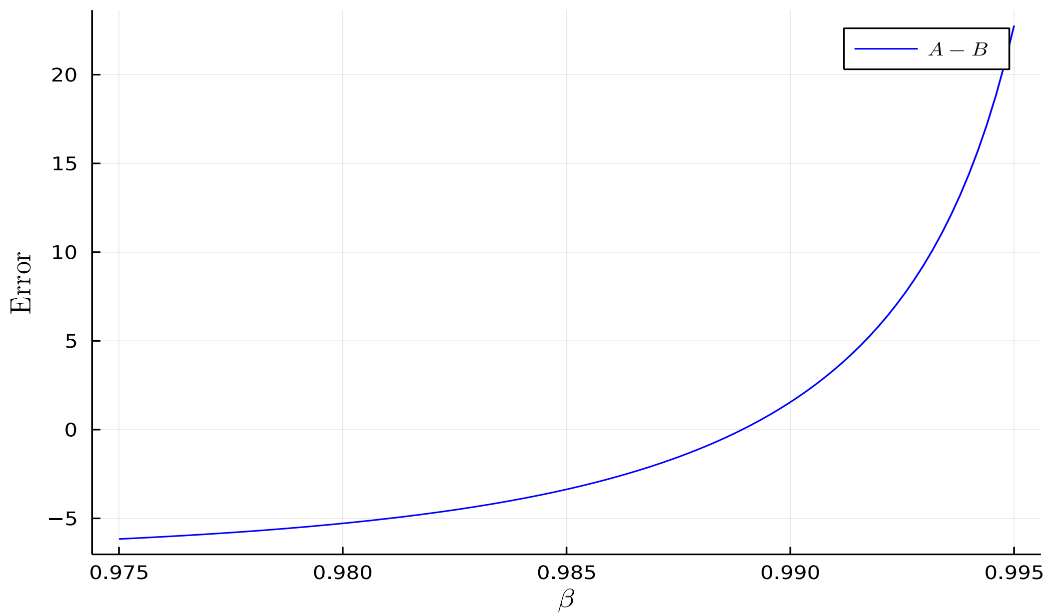


Figure 2: Error function $A - B$

bracket is $\beta_0 = 0.9889$ (rounded up to the 4th digit)