

# ECON 714. Quant Macro-Econ Theory

## Homework III

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### 1 Christiano, Eichenbaum, and Trabandt (2016)

I try to replicate all figures in Christiano, Eichenbaum, and Trabandt (2016) using Dynare 4.4.3. I make 7 folders to replicate them.

*1\_AOB* contains the codes estimating Alternating Offer Bargaining model. *4\_Calvo* contains the codes estimating the Calvo Sticky Wage model. Those two folders generate Figure 1, 2, and 3.

*2\_Nash* comprises the codes estimating Nash bargaining model and *3\_Nash-re-estimated* comprises the codes estimating Nash bargaining model with replacement ratio being fixed at 0.37. Both generate Figure 4, 5, and 6.

*5\_Simple* and *6\_General* have the codes estimating model with the simple and general wage rule. They yield Figure 7.

*7\_UnempBenefits* includes the codes performing experiments to investigate the effects of unanticipated, transitory increase in unemployment benefits using the estimated version of Alternating Offer Bargaining model. I use this folder to get Figure 8.

Each folder contains `cet.mod` and it is the main file. `cet.mod` defines endogenous variables, exogenous variables, and shocks. `params.m` sets parameters. Also, it lists the dynamic equilibrium equations for the medium-sized DSGE model in the supplement to Christiano, Eichenbaum, and Trabandt (2016). Then, it sets priors, estimates the model, and computes the steady state

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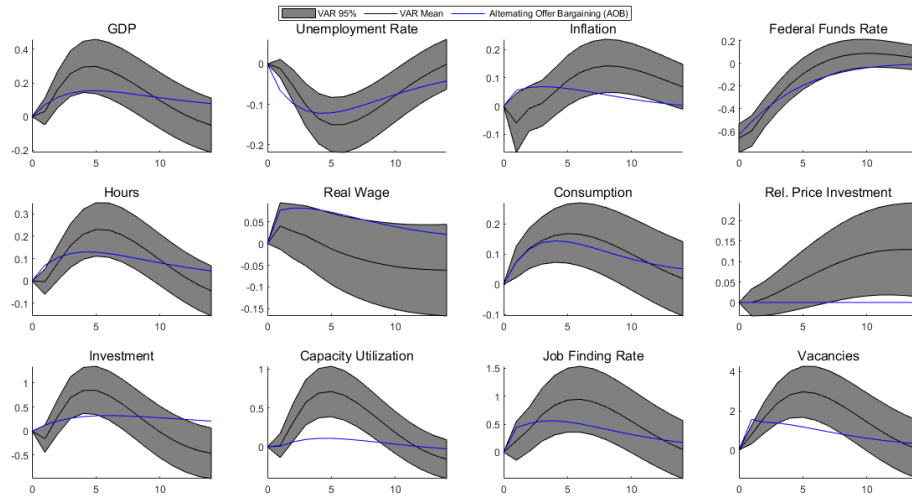
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using `cet_steadystate.m`. Finally, `cet.mod` with `get_VAR_resp.m`, `stack_model_responses.m`, `plot_var_model_irf.m`, and `figure8.m` generate plots in Christiano, Eichenbaum, and Trabandt (2016).

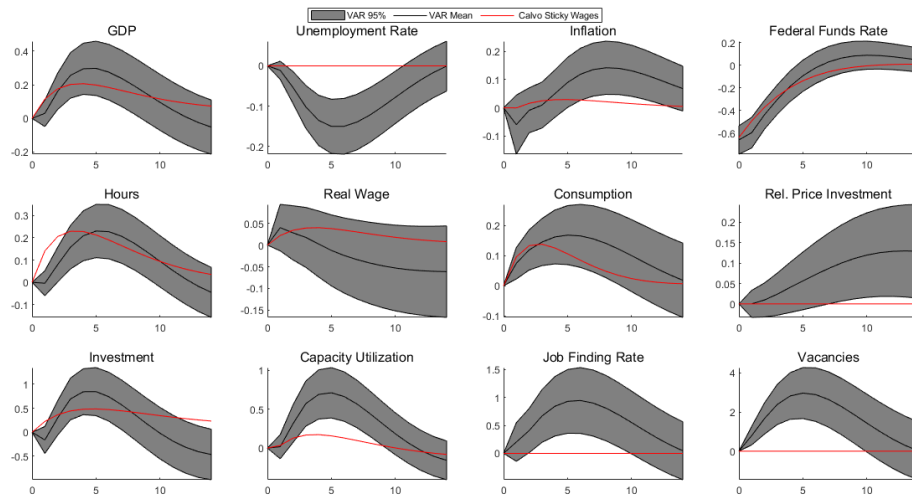
I can obtain similar results as Christiano, Eichenbaum, and Trabandt (2016).

## 1.1 Figure 1

Responses to a monetary policy shock: AOB

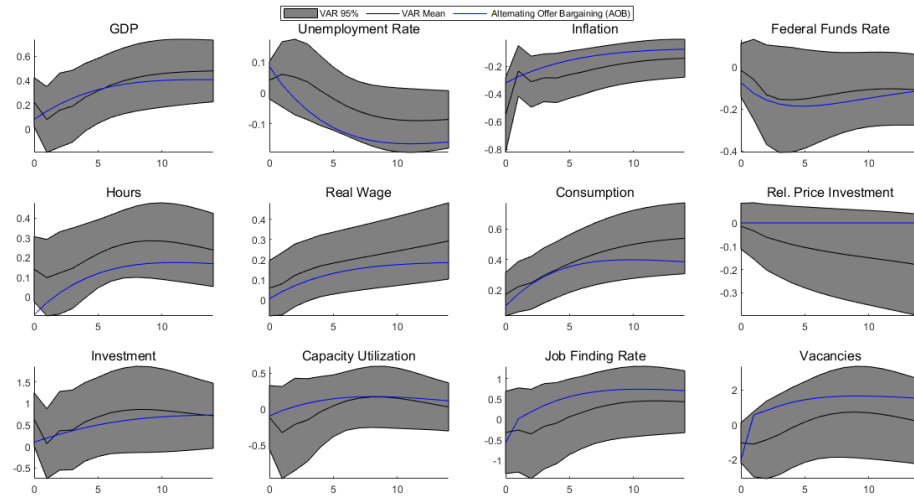


Responses to a monetary policy shock: Calvo

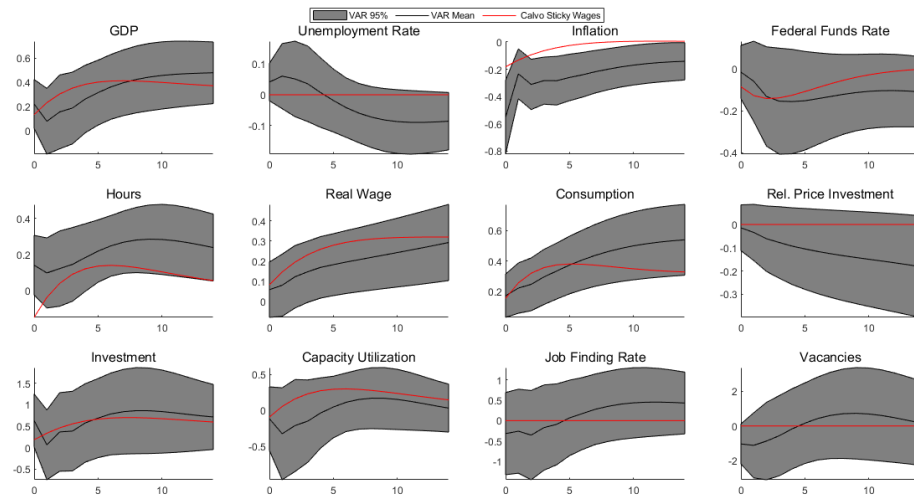


## 1.2 Figure 2

Responses to a neutral technology shock: AOB

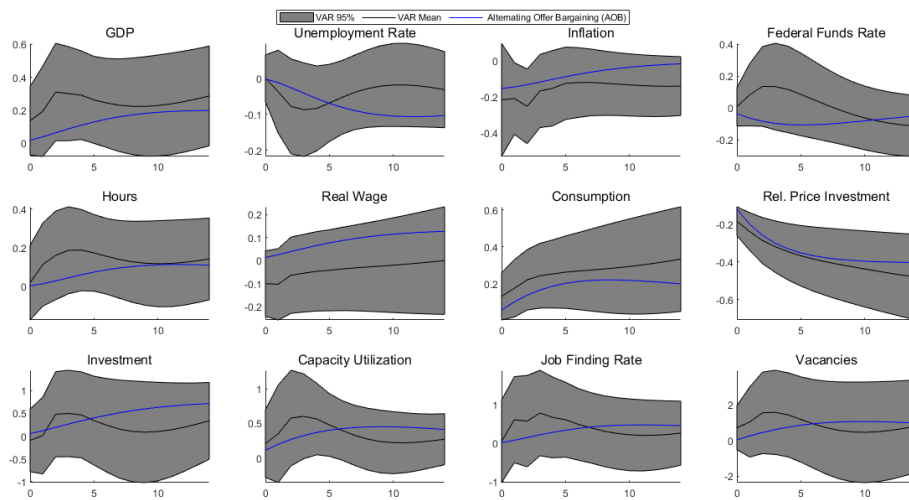


Responses to a neutral technology shock: Calvo

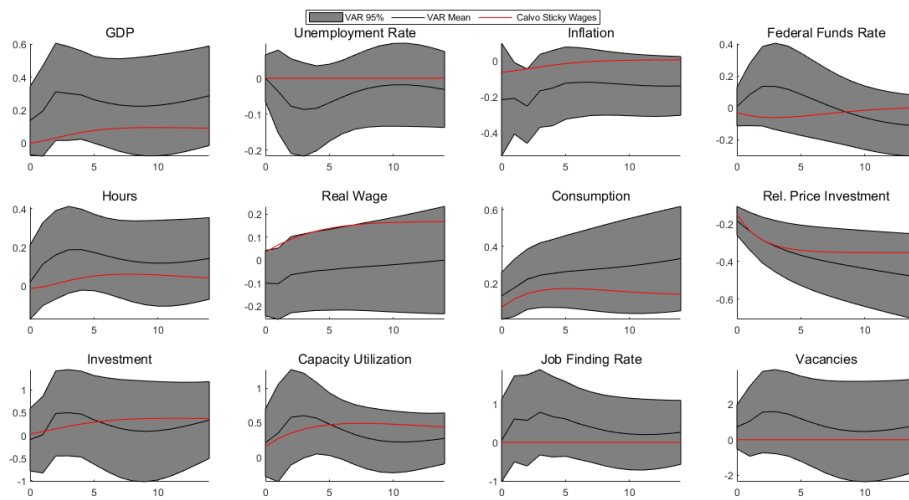


### 1.3 Figure 3

Responses to an investment-specific technology shock: AOB

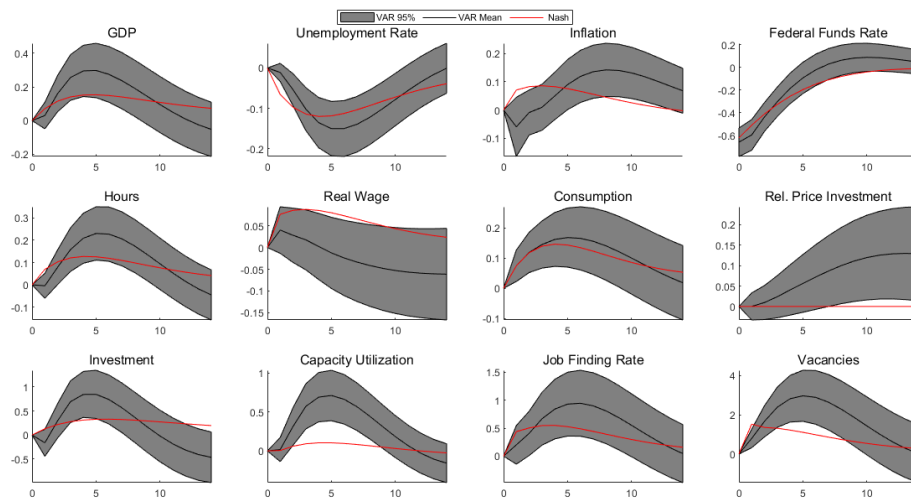


Responses to an investment-specific technology shock: Calvo

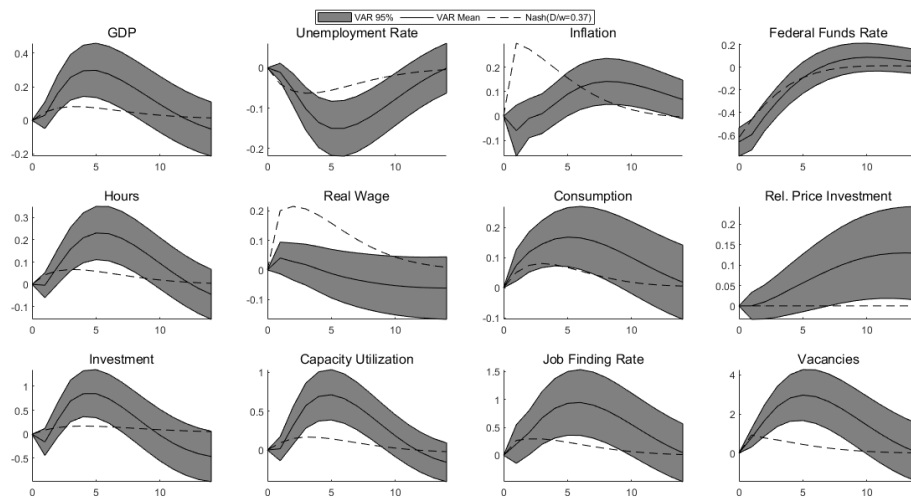


## 1.4 Figure 4

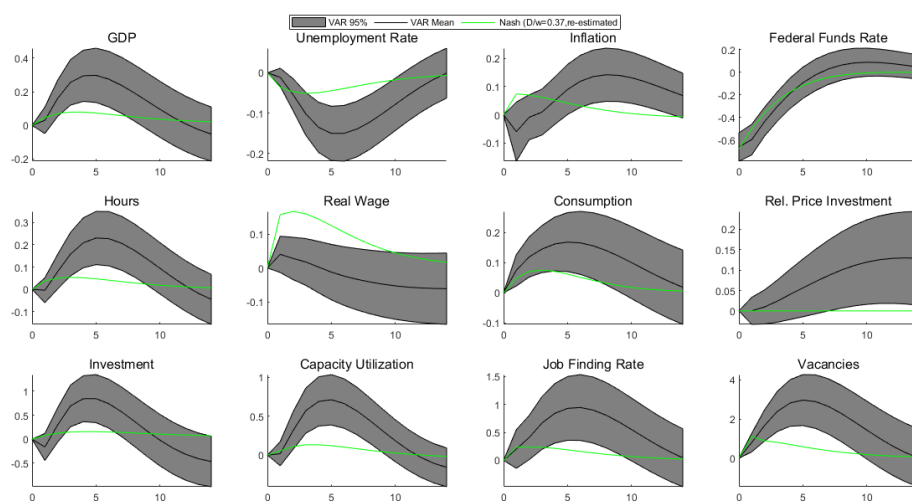
Responses to a monetary policy shock: Nash bargaining



Responses to a monetary policy shock: Nash bargaining

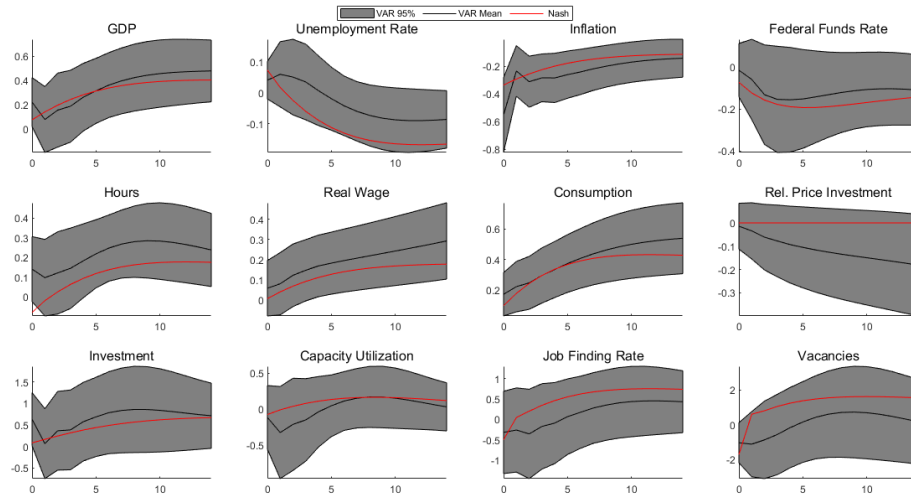


# Responses to a monetary policy shock: Nash bargaining

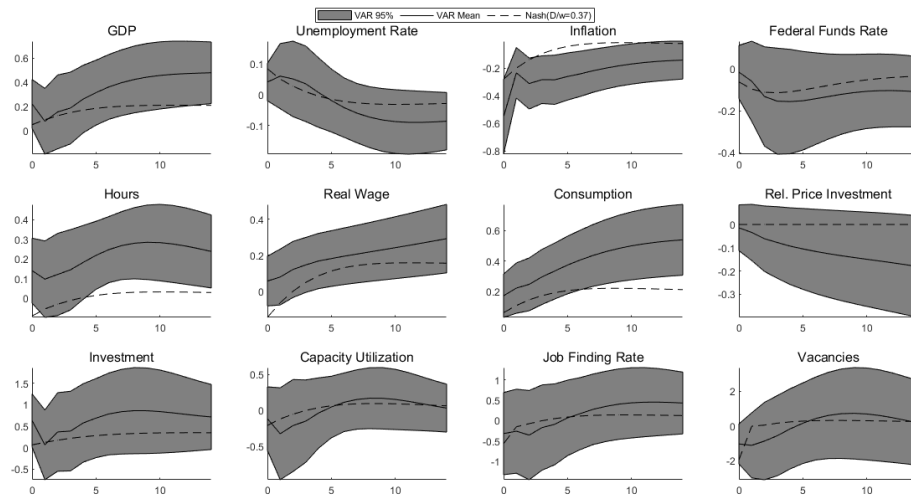


## 1.5 Figure 5

Responses to a neutral technology shock: Nash bargaining

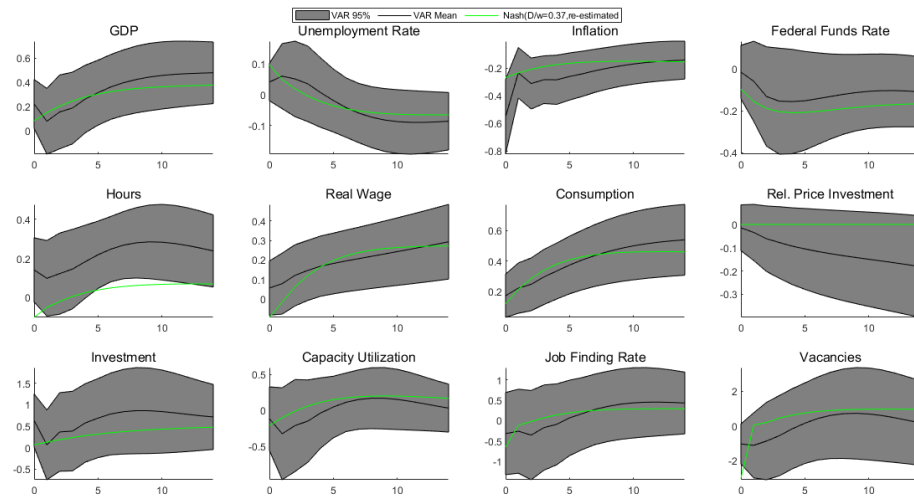


Responses to a neutral technology shock: Nash bargaining



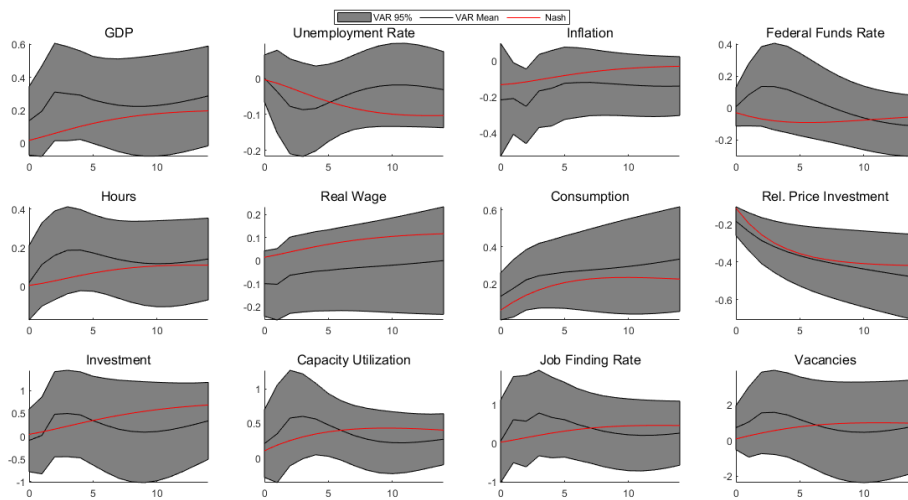


# Responses to a neutral technology shock: Nash bargaining

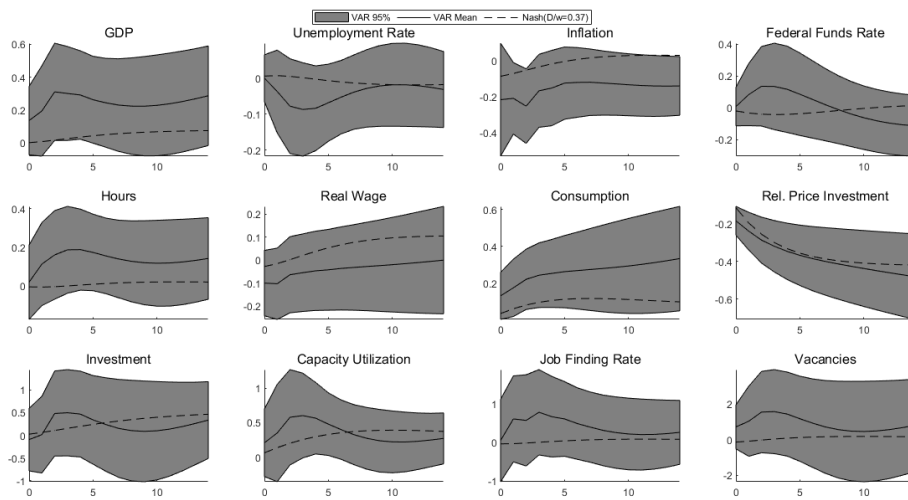


## 1.6 Figure 6

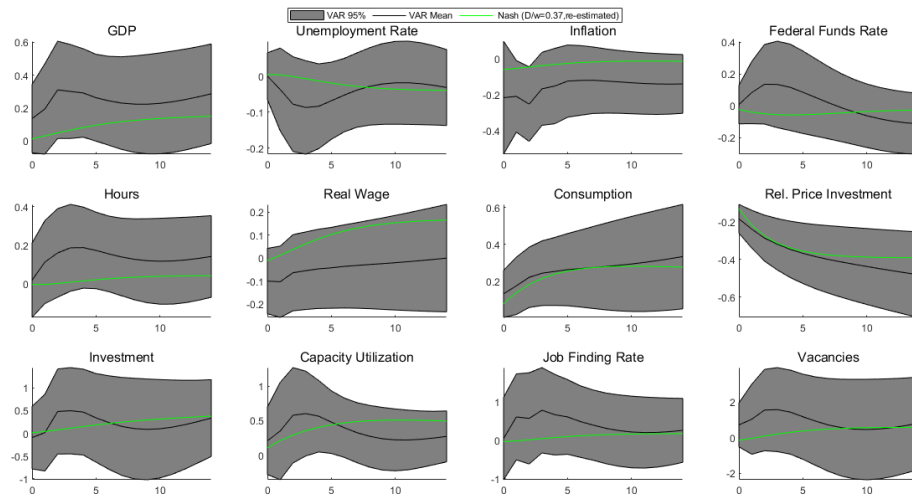
Responses to an investment-specific technology shock: Nash bargaining



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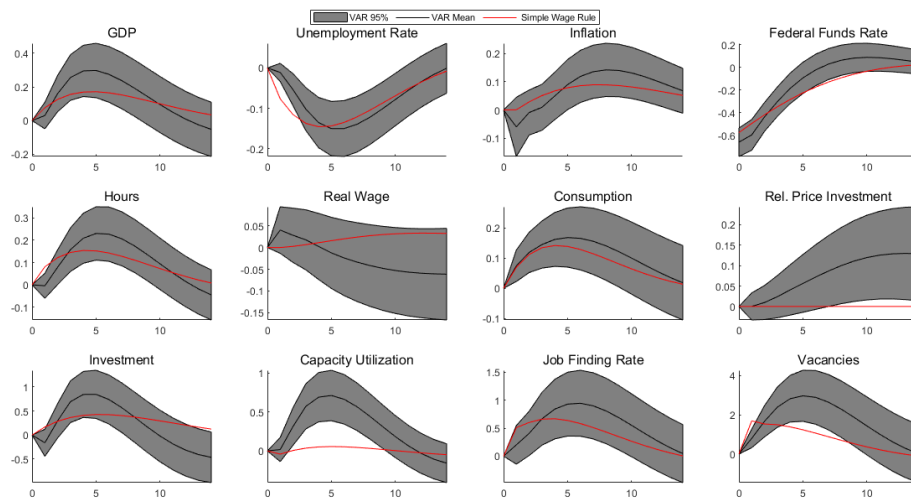


# Responses to an investment-specific technology shock: Nash bargaining

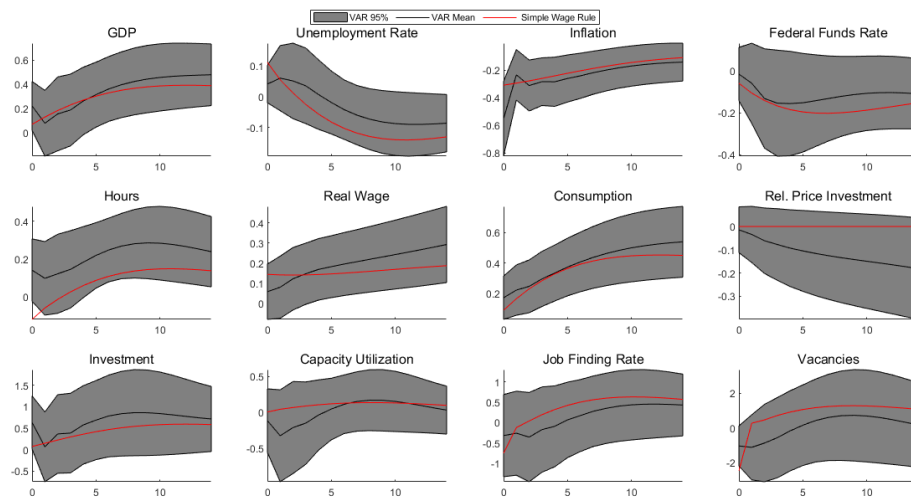


## 1.7 Figure 7

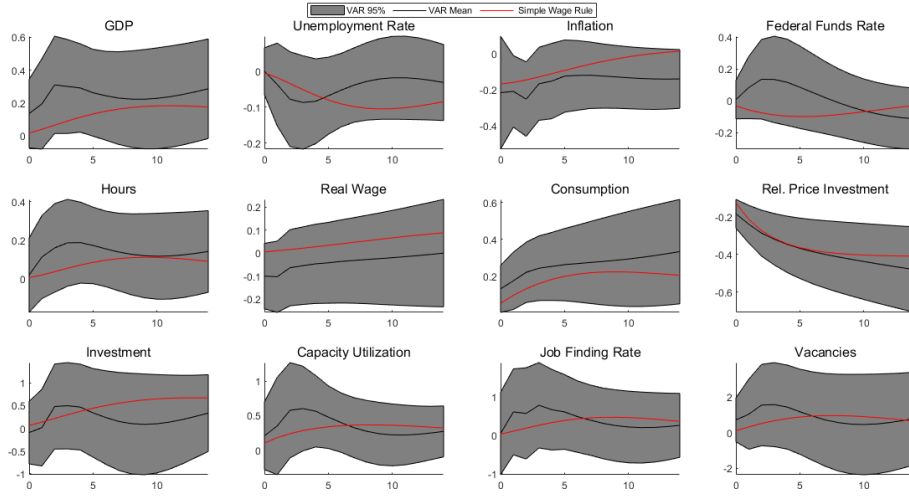
Impulse responses to shocks: simple wage rules



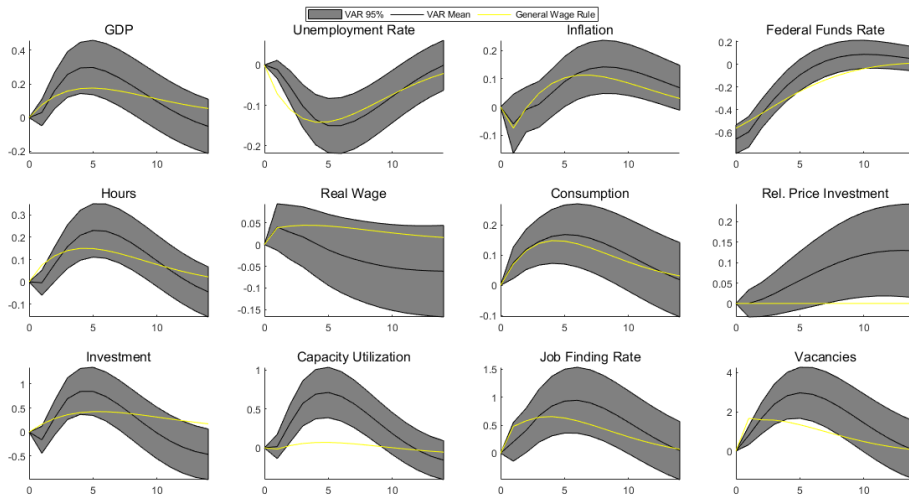
Impulse responses to shocks: simple wage rules



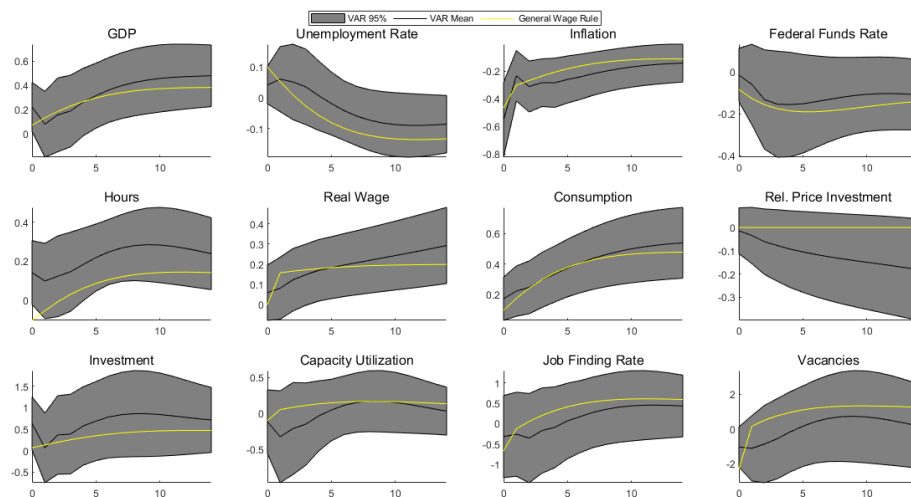
### Impulse responses to shocks: simple wage rules



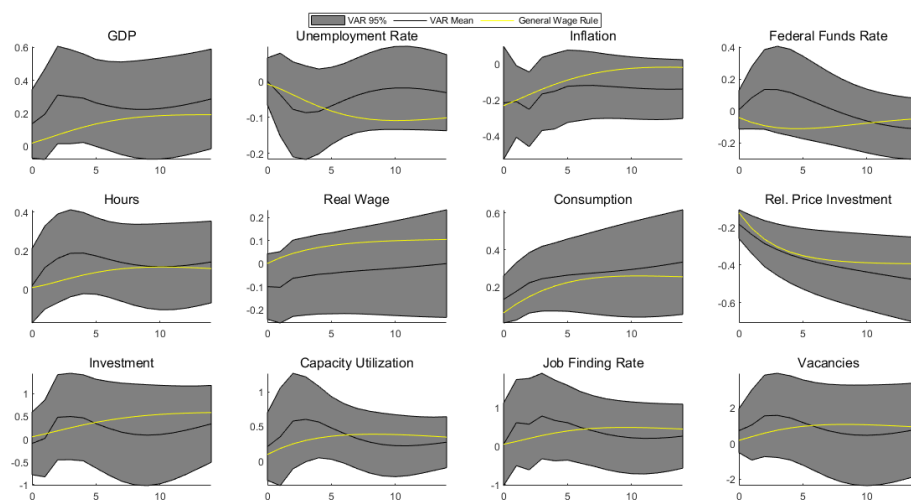
### Impulse responses to shocks: general wage rules



# Impulse responses to shocks: general wage rules

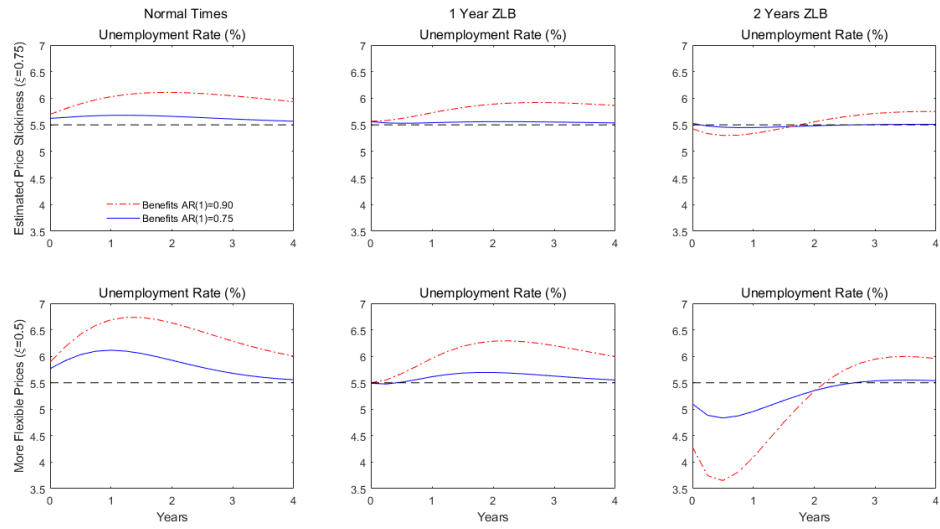


# Impulse responses to shocks: general wage rules



## 1.8 Figure 8

Dynamic effects of a rise in unemployment benefits



## References

- Christiano, L.J., M. Eichenbaum, and M. Trabandt (2016). “Unemployment and Business Cycles.” *Econometrica*, 84(4): 1523-1569.