PS2 Solutions

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Q3. Simulation of SW2007 model

The result is very close to the class replication of SW2007, and the only difference is of risk premium shock.

Our result shows a hump-shaped response in all three variables, while the class replication shows a more immediate monotonic response in output and investment. Furthermore, our result shows a ten times higher peak response in investment than the class replication, which is probably because of the different standard error of the risk premium shock, since the slides use 0.24, while in the standard SW2007 calibration it is 1.8513.

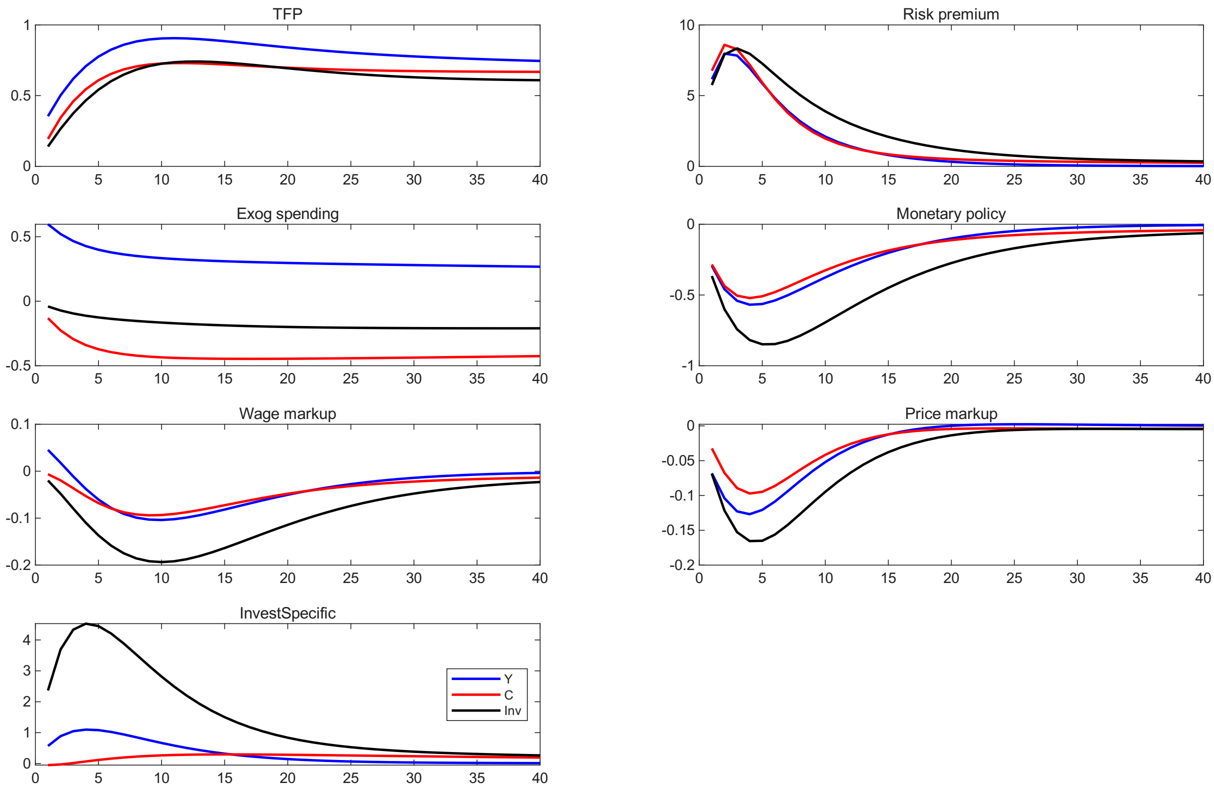

Figure 1: Class Figure Replication

Q4. 1st-time Replication

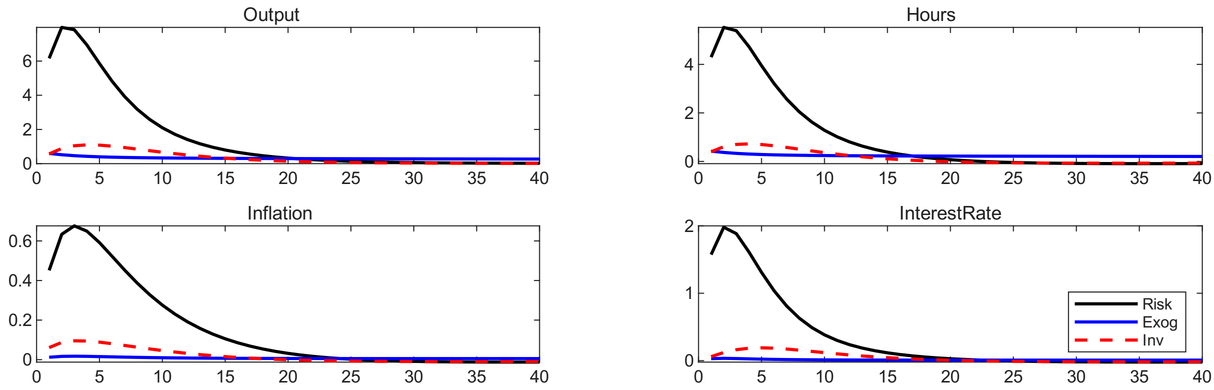

Figure 2: SW2007 Fig2 Replication - 1st time

Q5. 2nd-time Replication

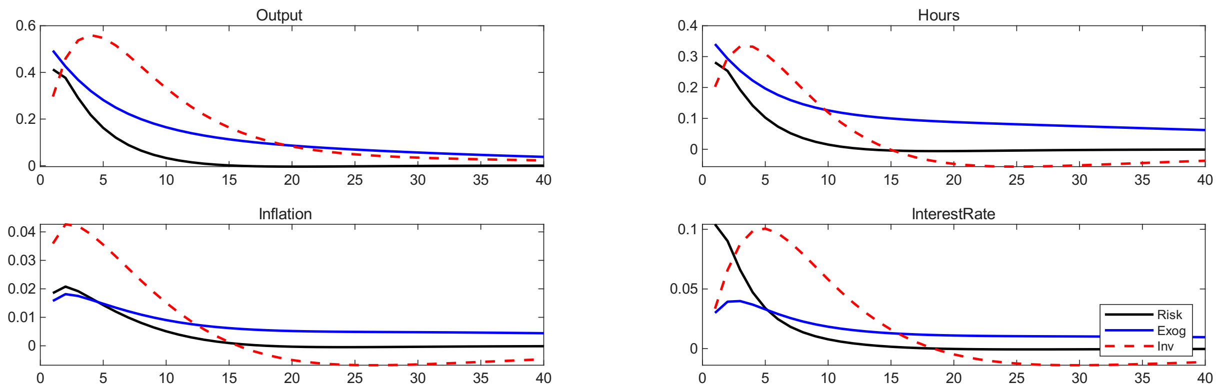

Figure 3: SW2007 Fig2 Replication - 2st time

Q6. SW2007 model to Cogan et al 2010

With $\omega = 0.5$, half the households consume current income; introducing the government budget constraint and tax rule mainly changes the fiscal-shock panel.

Non-fiscal panels remain close to Q3, since g is unchanged and debt/taxes barely move from a zero-debt steady state. Under a positive fiscal shock, disposable income for liquidity-constrained households props up consumption, as shown that the consumption falls less than in Q3 and can even tick up, while investment is still crowded out by both the resource cost and the interest-rate response, so output rises more than in Q3.

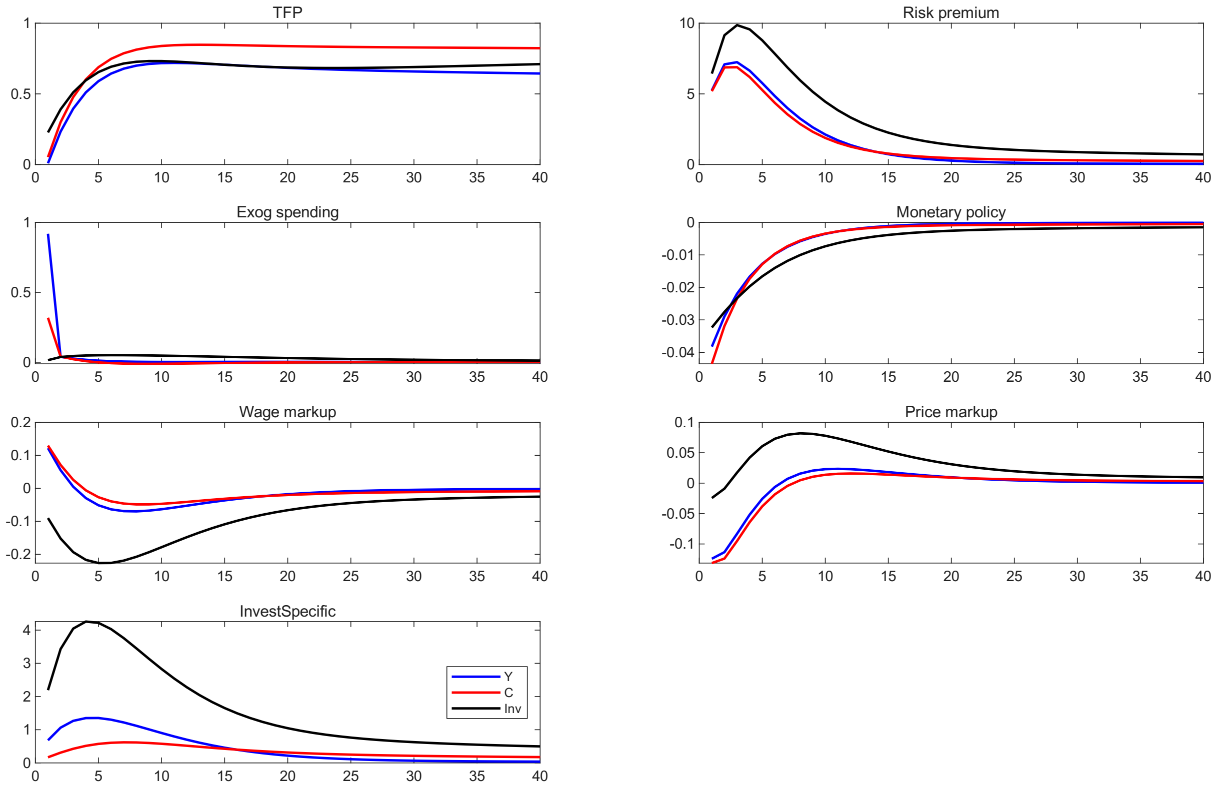

Figure 4: Cogan 2010(Simplified spending equation)

Q7. Original SW2007 model with government spending feedback

After restoring the original SW process for g, the only change is to make the fiscal shock persistent again. As a result the blue output line becomes more hump-shaped and longer-lived, the investment line stays depressed for longer, and the consumption linesupported by liquidity-constrained householdsdeclines less and does so more durably than in Q6. So, Q7 amplifies the persistence of the fiscal-shock responses relative to Q6, while preserving the short-run ranking, Y↑, Inv↓, C less negative than in the fully Ricardian benchmark. This brings the result closer to the persistent decay of Q3.

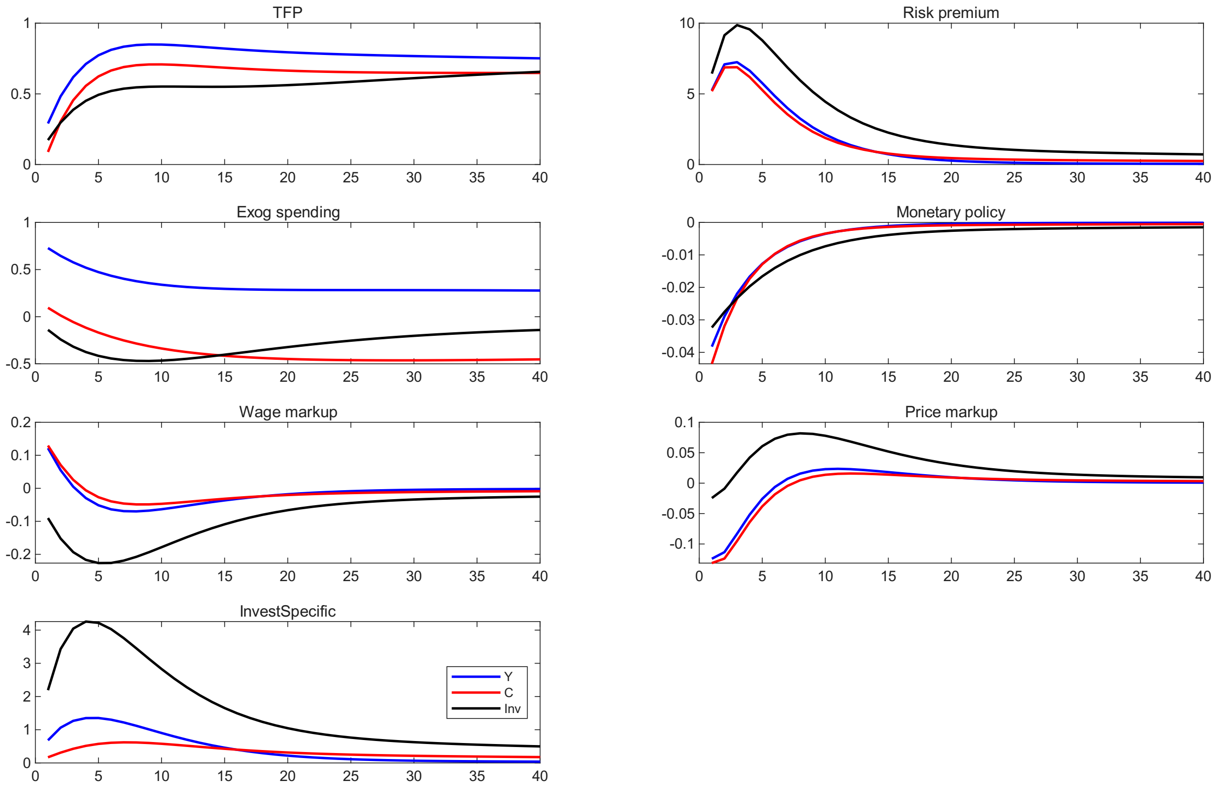

Figure 5: Cogan 2010 with government spending