Replicating Ellison and Tischbirek (2014)*

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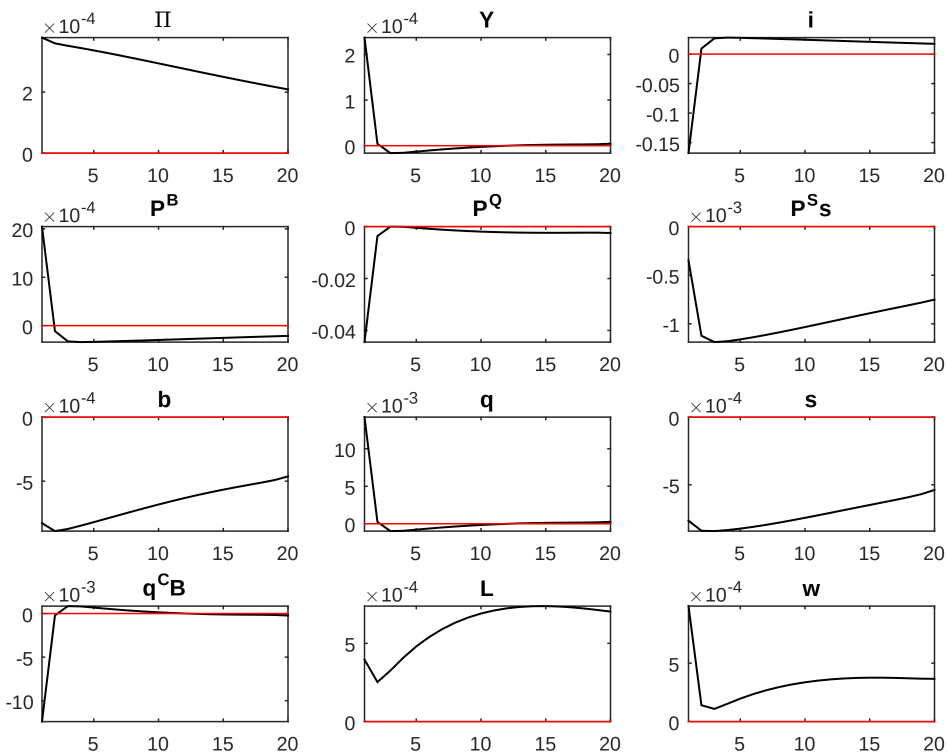
Equations and steady states are given (in truly exemplary fashion!) in the appendix to the paper. I use the equations, calibration and steady states as in the paper. Some minor additional points plus the replication of Figure 1 and 2 from the paper are given below.

Figure 1: Replication of Figure 1 in Ellison and Tischbirek (2014)



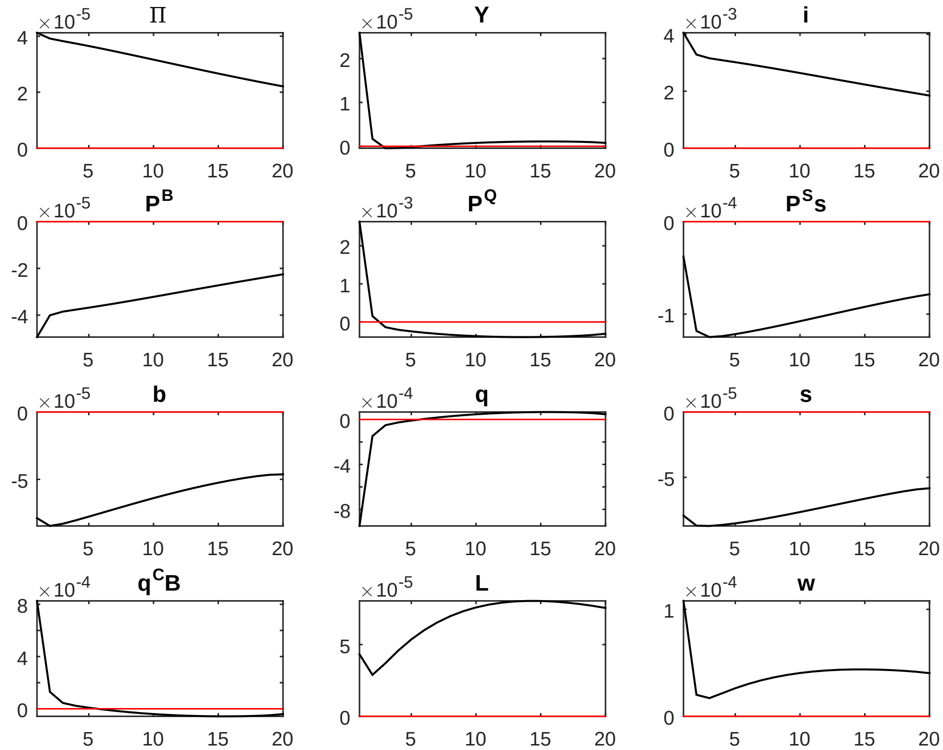
Typo in equation (B.4) The exponent is missing a pair of parenthesis, the equation should read

$$\frac{1-\alpha\Pi_{1t}^{\theta_t-1}}{1-\alpha} = \left(\frac{F_t}{K_t}\right)^{(\theta_t-1)/(\theta_t(\phi-1)+1)}.$$

Derivation of equation (16), p203 Define $x \equiv 1/(1+i_t^Q)$. Then

*Disclaimer: This note and the codes required to run the replication are available under http://bkolb.eu/codes/ET14.zip. They have been prepared by myself, based on the authors' paper – any errors are my own. If you find any, drop me a line under benedikt@bkolb.eu!

Figure 2: Replication of Figure 2 in Ellison and Tischbirek (2014)



$$
\begin{aligned}
\tau P_t^Q &= x + x^2 + \dots + x^\tau \\
\frac{\tau P_t^Q}{x} &= 1 + x + x^2 + \dots + x^{\tau-1} \\
&= 1 + x + x^2 + \dots \\
&\quad - (x^\tau + x^{\tau+1} + x^{\tau+2} + \dots) \\
&= (1 - x^\tau) \cdot (1 + x + x^2 + \dots)
\end{aligned}
$$

Using $1 + x + x^2 + \dots = 1/(1-x)$, we get

$$\frac{\tau P_t^Q}{x} = \frac{(1 - x^\tau)}{1 - x},$$

which with the definition of x gives equation (16). Note that we can simplify the equation further to

$$P_t^Q = \frac{1}{\tau i_t^Q} \cdot \left[1 - \left(\frac{1}{1 + i_t^Q} \right)^\tau \right]$$

References

Ellison, M. and A. Tischbirek (2014). Unconventional government debt purchases as a supplement to conventional monetary policy. *Journal of Economic Dynamics and Control 43*(C), 199–217.