Report on "A New Keynesian Model with Unemployment: The Effect of On-the-job Search"

Summary.

This paper augments a NK-DSGE model with labor market frictions by on-the-job search (OJS) and heterogeneity in the bargaining power of firms. It seems that the paper addresses two questions: i) does a technology shock, in this setting, produce a positive co-movement between productivity and unemployment and ii) can OJS amplify the responses of the labor market. The authors show that their model predicts an increase in unemployment after a positive technology shock and that the reaction of unemployment and labor market tightness are amplified when there is OJS.

Evaluation.

I appreciate the spirit of the paper. However, I have probably three major points and some more smaller issues concerning the paper. Together they cast doubt on the paper as it stands and make it hard for me to recommend publication. However, they may all be addressed by the authors and the paper could become a neat contribution.

Main Comments.

1) Model.

• It seems that there is now an abundance of empirical evidence showing that positive technology shocks tend to generate a negative co-movement between employment and productivity (Gali, 1999, 2010; Barnichon, 2010). The authors claim that they "[…]*present the first business cycle model with on-the job search which builds on the empirical finding that the levels of unemployment and productivity are* positively correlated.".

They think that other papers "[…]*created wage dispersion by introducing different cost levels for different type of firms. Although we preserve this assumption in our model, there is an additional source of wage dispersion: the difference in bargaining powers of firms.*"

• For me it is unclear what drives the positive co-movement of output and unemployment in the author's model. On-the-job search does not seem to matter for direction of the impact of the technology shock on unemployment (Figure 1). Without on-the-job-search, the bargaining power of aggressive and passive firms as well as their hiring costs are the same. I understand that without OJS the model collapses to the model of Gali

(2010) with sticky prices, search frictions, flexible wages and a simple interest rate rule. However, the results seem to be qualitatively different from Gali (2010) (see Figure 5b in Gali, 2010). Can the author's make a statement where this discrepancy comes from?

- It seems that the paper's results also contradict other articles that introduced OJS in NK models. I think the authors should explain in greater detail where the difference between the present paper and others (e.g., Krause and Lubik, 2007) comes from.

2) Steady State and calibration.

- I would like to know more about the steady state results. I am particularly interested in the case when aggressive firms have maximum bargaining power. How do wages and vacancies in aggressive and passive firms differ in steady state?

- Why do the authors calibrate the ratio of aggressive firms to 0.5? If the authors think that the aggressive and passive firm assumption is a good approximation for labor unions, why do they not use the ratio from the data (union coverage etc)? How crucial is this assumption for the amplification effect (which could be an interesting story by itself)?

3) Presentation of Results.

- I understand that one of the main goals of the paper is to bring the model closer to the data. However, from Figure 1 und 2 alone I am not able to judge how large in magnitude the amplification is. It would helpful if the authors provided some tables showing simulated absolute and relative volatilities and compare them with UK labor market data. The authors should also provide cross-correlations, which would make it easier for the reader to inspect the mechanisms at play and see what is the reason for the increase in unemployment volatility and how important in magnitudes this increase is.

- Some of the important impulse response function are missing. Can the authors show the impulse response functions of vacancies and wages for each of the firm types?

Minor Points.

1) Page 4.

   "*As shown by Barnichon (2010), a NK model with search frictions is capable of fulfilling two arguments of* the Shimer puzzle*: A positive technology shock leads (i) to an increase in the unemployment rate and (ii) to a decrease in labor market tightness*"

I have an issue with this sentence. It can be misleading. Shimer (2005) documents that the canonical search and matching model is not able to generate the observed fluctuations in unemployment and vacancies in response to shocks of a plausible magnitude. Shimer's model predicts a decrease in unemployment in response to a technology shock.

My understanding of Barnichon's article is that it is the combination of search frictions, sticky prices and variable hours and labor effort that creates the positive co-movement between productivity and unemployment. When a positive technology shock hits the economy and since prices are rigid, productivity increases more than aggregate demand. Increasing productivity leads firms to reduce hours/ effort because employment adjustments are subject to frictions. Firms post less vacancies since the value of a marginal worker decreases and hence unemployment goes up. This is very different from the present paper.

2) Units in figures.

In models of labor stocks and flows, it is necessary to be very clear about units. It seems that all dynamics are calculated in terms of log deviations from steady state values. More detailed footnotes defining units in the figures would be helpful

References.

Barnichon, R. (2010): Productivity and Unemployment Over the Business Cycle. Journal of Monetary Economics 57 (8), 1013-1025.

Gali, J. (1999). Technology, Employment, and the Business Cycle: Do Technology Shocks Explain Aggregate Fluctuations? American Economic Review 89 (1), 249-271.

Gali, J. (2010). Monetary Policy and Unemployment. In B. M. Friedman and M. Woodford (Eds.), Handbook of Monetary Economics, Chapter 10, pp. 487-546. Elsevier.

Krause, Michael and Lubik, Thomas A. (2007): On-the-job search and the cyclical dynamics of the labor market, Discussion Paper Series 1: Economic Studies 2007,15, Deutsche Bundesbank, Research Centre.