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Review of the Dissertation of Frantisek Brazdik
on
„Essays on Mathematical Methods for Economics“
focusing in particular on chapter 3,
“Announced Regime Switch: Optimal Policy for Transition Period”

I have read the dissertation of Frantisek Brazdik. I found his research to be very interesting. As discussed when I was first asked whether I would be available as a potential referee, I have focused in particular on the third chapter of the thesis. This chapter falls into my area of expertise that is monetary macroeconomics.

I have also looked at chapters 1 and 2. I found both of them interesting and seemingly competently executed. Mr. Brazdik has an impressive command of mathematical methods for economic analysis for a Ph.D. candidate.

Turning to chapter 3, I first summarize the analysis conducted by Mr. Brazdik. He uses a state-of-the art New Keynesian model of a small open economy. These models are often referred to as New-Keynesian Dynamic Stochastic General Equilibrium Models (DSGE). They combine the rigor of the real-business cycle approach to the macroeconomic modeling with additional frictions, such as price rigidies, market power, and habit persistence. As a result these models are useful for the study of monetary policy.

The model used by Mr. Brazdik is very similar to the model estimated by Justiniano and Preston, 2004, that is apparently now forthcoming in the Journal of Applied Econometrics. Justiniano and Preston estimate the model with data from Australia, Canada and New Zealand. They also study optimal policies under parameter uncertainty. Mr. Brazdik estimates this model with data from the Czech Republic. He uses state of the art Bayesian estimation methods, which are an appropriate tool for this type of theoretical model, and given that the fact the available data series is relatively short.

Mr. Brazdik's interest in this model and objective for the study is quite different from Justiniano and Preston. Mr. Brazdik aims to study the design of monetary policy during a transition to fixed exchange rates. This is clearly a very important question of relevance to the Czech Republic as it considers tying itself more closely to the European Monetary Union.

To analyze this question, Mr. Brazdik extends the basic small open economy to allow for a pre-announced regime change and transition period. This is an interesting and novel extension. It introduces an important nonlinearity. Thus, Mr. Brazdik uses numerical methods for his analysis, in particular second-order approximations obtained by means of the DYNARE++ solution algorithm.

A first assessment of the implications of the transition to fixed exchange rates for monetary policy is reported in form of impulse response functions to the shocks considered in the model. The findings are interesting and most are intuitive.

Mr. Brazdik then proceeds to an analysis of optimal policy that is the optimal choice of the parameters in the interest rate rule. The optimal values are chosen to maximize a standard central bank loss function with inflation, output and interest rate volatility. He computes the loss under the optimal rule for different lengths of the transition period. Interestingly, the longer the period, the lower the loss. The characteristics of the optimal rules are also described. Furthermore, Mr. Brazdik analyses the implications of the transition on volatitilies of endogenous variables and the extent to which they are due to domestic and foreign schocks. As the fixed exchange rate is approached, the impact of foreign shocks becomes larger and the exchange loses its buffering role.

Overall evaluation

Chapter 3 is an interesting and competently executed study that is quite policy relevant. It contains novel extensions of a state-of-the-art model analyzed with modern estimation and simulation methods. The results are interesting and intuitive.

I think this work is certainly sufficient for a Ph.D. dissertation. In my view, Mr. Brazdik's dissertation is ready for the defense and the eventual award of the Ph.D. following a successful defense.

Further suggestions

I have a few suggestions that are intended for further work following the conclusion of the dissertation and for possible publication in a good economic journal subsequently.

1. The economic and policy implications could be drawn out more. The findings are interesting and only discussed rather briefly.
2. Proofreading and checking of the grammar will be important before sending the current draft to a journal.
3. What would happen if you include mark-up shocks?
4. It seems in this model, fixing the exchange rate is generally a bad idea. Could you discuss this a bit more, and suggest possible reasons when fixing the exchange rate might be a good idea. Perhaps in the conclusion.
5. Numerical methods: the regime change is strongly non-linear, thus the second-order approximation may exhibit non-trival approximation error. This should be acknowledged. Better even, if you can assess it with some exercise, perhaps using the so-called "deterministic" solution algorithm in Dynare which allows more general nonlinearities. Perhaps, with some stochastic simulations (i.e. sequences of shocks). Though, this algorithm does not lend itself easily to do the interesting optimal policy calculations for the transition period, it could be used to assess possible changes with regard to the impulse responses.

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