

Discussion: Jan Brůha - A Small Labor Market Model for the Czech Economy

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Aim of the paper

- a small model for joint modelling of the labor force, employment, wages, hours worked, output and GDP deflator
- model properties examination
 - multivariate filtering
 - second moments (data observations vs model implications)
 - forecasting
- extension to the data rich environment

Model - General Assumptions

- every variable is decomposed into the trend component and the cyclical component
- the trend component and the cyclical component are modelled jointly in the state-space framework - big advantage
 - no data prefiltering before estimation (an arbitrary choice of detrending method can significantly change the behaviour of the model and obtained results can substantially differ)
 - all obtained trends are filtered jointly and thus are consistent with each other, while those obtained by univariate filters can be inconsistent.
- the model is estimated by the prediction-error minimization method

Model - Trend Component [1/2]

- based on log-linear specifications of production function and a labour demand equation
- every state variable can be described in the long run by some combination of trends in labor force, labor productivity, unemployment, hours per employee and GDP deflator.
- trends are modelled as ARIMA(1,1,0) (in contrast to Harvey and Jaeger (1993) framework where ARIMA(0,2,0) is used).

Model - Trend Component [2/2]

- it allows for fluctuations of drifts in trends around some certain values, while Harvey and Jaeger model of trends does not and implies random walks for these drifts
- trend in labor productivity growth
 - Harvey and Jaeger model implies that if growth in labor productivity becomes negative, all its future expected values will remain negative.
 - This model implies that gradual recovery of this growth will happen.
- inflation trend
 - in Harvey and Jaeger model follows random walk
 - in this model fluctuate around inflation target
- In my opinion, this modification of modelling trends in time series has convincing economic reasoning and is one of the main contributions of this paper.

Trend Component - Suggestions

- modification of the long run dynamics of unemployment in order to incorporate some long run hysteresis in the development of the unemployment
- including the capital into the production function and modelling the development of capital stock

Model - Cyclical Component

- The cyclical dynamics of the model is determined by a VAR(3) model.

Multivariate Filtering

- comparison of model-based filter with standard HP filter and HP filter with end-point bias reduction
 - consistency of filtered trends from the model-based filter (in contrast to univariate HP filters)
 - subject to smaller revisions than those obtained by HP filters
 - more negative cyclical position in the current recession than HP filters
 - the model-based filter also provides a better story for development of the inflation in the period 1998-2000
- comparison is interesting
- maybe more interesting would be comparison of suggested filter with some multivariate filters, as univariate HP filters are not formidable rivals

Second Moments [1/2]

- data observations vs model implications
- comparison of various cross-correlations, cospectra, quadrature spectra, sample coherences and population cross-correlations
- It seems that this model can replicate most of the business cycle features in the data.
- most problematic area - the relation between real wage, employment and hours worked
- The model can not explain some of the long run movements in these variables.

Second Moments [2/2]

- problem of all the models with neoclassical view on labor market in the long run
- According to this view, unemployment is given in the long run by its natural rate, which is determined purely by institutional factors while cyclical factors play no role.
- model predict no long run hysteresis of unemployment
- at odds with empirical evidence (as pointed out by author)
- my previous suggestion - modify long run dynamics of unemployment

Forecasting

- experiment with conditional forecast
- How would model's forecast of labor market variables development look like, if we had known the real decline in real output during recent recession.
- forecasting power is not bad (despite the model simplicity)
- model can do a good job in forecasting of some variables (real wage, hours worked and inflation)
- I consider this experiment very interesting.

Data Rich Environment

- extension of the model to data-rich environment
- incorporate a large set of additional data in order to improve forecasting power of the model
- very difficult estimation technique with many steps
- only marginal improvement and only for a subset of variables
- possible reason - short length of available data for CZ
- interesting and very sophisticated tool which can prove to be useful in the future

Other Minor Suggestions

- several extensions of the paper, mainly for reader's convenience
- to show some non-technical interpretation of cospectrum, quadrature spectrum, sample coherence and population cross-correlations (more friendly for readers who are not so familiar with spectral analysis of time series)
- to show some technical details about the estimation technique (prediction-error minimization method)
- to show and interpret some of the impulse response functions

Conclusion

- elegant model of labor market
- big advantage of modelling the trend component and the cyclical component jointly in one model
- reasonable specification of trends
- extension to the data rich environment - very interesting tool
- all suggestions should be regarded as topics for further research

Thank you for your attention.