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Comparing shocks and frictions in US and Euro Area business cycles: A Bayesian Approach
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The creation of a single currency, the euro, in January 1999 has greatly stimulated the analysis of aggregate macro-economic developments in the new currency area. Because this aggregate analysis necessarily relies to a large extent on a sample period before the actual establishment of EMU, the conclusions that can be drawn from such an analysis should be treated with some caution. However, one of the robust and somewhat surprising findings has been that in many cases the business cycle behaviour of aggregate euro macro variables such as output, inflation and interest rates has been very similar to that observed in the United States. For example it has been shown that the variances of the main macro-economic time series and their cross-covariances with output show very similar patterns in the euro area and the United States. Similarly, the estimated effects of monetary policy shocks in the euro area appear to be very similar to those found in the United States. Finally, also structural estimations of the New-Keynesian Phillips curve for the euro area and the US data have shown that the estimated parameters, including the degree of price stickiness, are comparable in both areas.

Building on previous work, this paper provides further evidence of the similarities and differences in the structural characteristics of the economy in the two largest currency areas in the world by estimating a fully specified dynamic stochastic general-equilibrium (DSGE) model for both areas over the same sample period. The model used features a relatively large number of frictions and shocks, which are designed to capture the time series properties of the main macro-economic data. The dynamics is driven by ten orthogonal shocks including productivity, labour supply, investment, preference, cost-push and monetary policy shocks. The DSGE model is estimated for the euro area and the United States separately with Bayesian econometric techniques and using seven key macro-economic data series: real GDP, consumption, investment, prices, real wages, employment and the nominal interest rate. The baseline estimation period is from 1974 till 2002.

One advantage of our structural methodology over more reduced-form approaches is that we are able to directly compare both the structural parameters and the sources of business cycle developments across the two currency areas. This allows us to investigate whether differences in business cycle behaviour are due to differences in the type of shocks that affect the economy, differences in the propagation mechanism of those shocks or differences in the way the respective monetary authorities respond to those economic developments. Of course, the more structure is imposed on the estimated model, the more the results will be coloured by the selected theoretical specification. Therefore, it is important to adopt a theoretical structure that is not strongly rejected by the data. The model that is used in this paper has a marginal likelihood that is comparable to that of unconstrained and low-order Bayesian VARs.

Our main conclusion is that it is indeed difficult to detect significant differences in either the structure of the economy or the sources of business cycle fluctuations across the two currency areas. Differences in actual business cycle developments are mainly due to similar types of shocks affecting the two economies at different times. Regarding the sources of business cycle fluctuations our main result is that, while "demand" and monetary policy shocks play some role in the short run, it is mainly productivity and labour supply shocks that drive output developments at business cycle frequencies. This is true in both the euro area and the United States. Regarding the structure of the economies a substantial degree of nominal and real frictions are necessary to capture the dynamics of the main variables discussed above. We estimate considerable nominal rigidities in both goods and labour markets. If anything, we find that nominal wage rigidity is greater in the United States than in the euro area. Also the real frictions such as the degree of habit persistence, the costs of adjustment in investment, variable capacity utilisation and fixed costs in production are estimated to be significant and comparable in size in the two areas. Finally, we find no evidence of significant differences in the way monetary authorities have responded to output and inflation developments. Short-term interest rates respond somewhat stronger and faster to changes in the output gap and inflation in the United States, but they are more persistent in the euro area.