Paul Ormerod: Random matrix theory and the evolution of business cycle synchronisation, 1886-2006

Comment by Christian Dreger

The paper uses random matrix theory to examine the evolution of business cycle synchronization over the past 120 years. Synchronization is often measured by correlation coefficients between GDP growth rates or output gaps. Due to a finite number of observations, the appropriate interpretation is critical. The random matrix approach is used to determine the information content of the correlation coefficients. Specifically, the eigenvalues of the empirical correlation matrix are compared to those generated by a pure random matrix. While cycles of the major economies did not move in line before WWI, there is some weak evidence towards synchronization in the interwar and Bretton Woods period. Due to common oil price shocks, synchronization reached high levels between the mid 1970s and the mid 1980s. Afterwards, the degree of co-movement of economic activity declined in the 1990s, but increased again towards the end of the decade. The analysis of the maximum eigenvalues is complemented by hierarchical clustering of correlation coefficients.

The paper takes an innovative approach, but most of the results are already known, especially for the 1973-2006 period, see Benalal et al (2006), among others, and the literature cited therein. In addition, it remains unclear why real business cycles might have converged. At least, the reader should be provided with some idea regarding the main drivers of this development, for example whether international trade or financial integration are the proponents of the development. This is especially of interest in the cur-

rent financial crisis, where an impact of the US slowdown on the euro area economy is highly debatable.

Moreover, the synchronization result is a little bit problematic. If country data is used, the usual finding is a higher degree of business cycle convergence in recent periods. However, this result might reflect an aggregation effect, as it is often not confirmed in regional data. See for example Owyang (2005) for the US experience.

References

Benalal, N., Diaz del Hayo, J.L., Pierluigi, B., Vidalis, N. (2006): Output growth differentials across the euro area countries: Some stylized facts, ECB Occasional Paper 45.

Owyang, M.T., Piger, J., Wall, H.J. (2005): Business cycle phases in US states, Review of Economics and Statistics 87, 604-616.