Economics e-journal

Referee report on:

MS699 CARTEL IN THE CEMENT INDUSTRY – AN ATTEMPT TO IDENTIFY IT

The paper explores the detection of collusion in the Indian cement industry using a Markov switching autoregressive GARCH model. The methodology is to identify periods of relatively low (unconditional) volatility in the price of the product, which are thought to correspond to periods of explicit or tacit collusion within the industry, within a dynamic framework including evolving conditional volatility. It follows two earlier papers in which the methodology was developed and applied to the Polish cement industry. The paper's contribution is in exploring further the suitability of this technique by applying it to a data-set of longer duration and higher frequency and comparing the results with the findings of a regulatory investigation into the industry. The results find evidence of three periods of collusive behaviour between: 1994–1996; 2000–mid 2001; and, 2006. Its conclusions have some, but not complete, overlap with those of regulatory investigation.

General Comments

(i) Is the contribution of the paper potentially significant?
The contribution of the paper is in demonstrating wider applicability of the methodology for detecting periods of collusion in an otherwise non-collusive industry. This is worthwhile, but there re-application to an equivalent industry, widely regarded as vulnerable to cartel formation, in a different country limits the significance of the contribution. Since any useful test needs to be able to reject as well as to accept, it would have been nice to see the methodology applied to at least one other industry where no collusion is suspected and to a more debatable case.

There are other possible causes of regime switching volatility, such as changes in the volatility of the macroeconomy, and the analysis would have been strengthened if these had been discussed and/ or discounted in section 2 or 3. It would be nice to see if the analysis of more competitive industries were vulnerable to these other causes?

(ii) Is the analysis correct?
The treatment of seasonality is an important part of the analysis. Clearly any seasonality in the data that is not either removed or adequately modelled has the potential to distort the results of a regime switching model. First of all, I would have liked some discussion of why the data should be seasonally adjusted, in preference to modelling the seasonality within an MS(Seasonal AR)GARCH. Secondly, given that the data are to be adjusted, the Hodrick-Prescott is not an appropriate filter for the task. The HP filter is the optimal filter to extract a white noise observation error from a second order random walk (I(2)) trend, see for example Proietti (2009). The results in table 1, however, show that the data are stationary, not I(2). The HP filter is widely used to identify business cycles in quarterly macroeconomic data, rather than to remove seasonality from a weekly series. The distinction is important since the value of the smoothing parameter, routinely set to 1600 for the H-P filter, may not be appropriate in this setting. This stage really should be done again using another seasonal adjustment procedure. Possible candidates are TRAMO-SEATS, see Gomez and Maravall (1996), which will fit a (conditionally homskedastic) unobserved components model to the data and X-12 ARIMA, see Findley et al (1998), which is agnostic on the underlying model.

References

Findley, D. F., Monsell, B. C., Bell, W. R., Otto, M. C., Chen, B., 1998. New Capabilities and Methods of the X-12-ARIMA Seasonal-Adjustment Program. J. Business Econom. Statist., 16, 127–177.

Gomez, V., Maravall, A., 1996. Programs TRAMO and SEATS, Instructions for the User. Bank of Spain Working Paper No 9628.

Proietti, T. (2009) Structural Time Series Models in Palgrave Handbook of Econometrics Volume 2, Patterson, K.D. and Mills, T. (eds)

Specific Comments The paper is generally well written and easy to follow, although there are places where sentence construction could be simplified and the author's opinions left out. I also noted the following points.

p 1.n para 1 define NEIO.

p2. para 3 existent, existing?

p4. para 2 egzonic, exogenous?

para 3 1930's of XX century.

p9. table 1 presentation might confuse a casual reader expecting asterisks to correspond to significance values. The footnotes appear unnecessary given that you report p-values.

p11. eq (7) should the $-$ be in front of h_t?

p13 para 1 conditional probabilities of, conditional probabilities that?