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Predicting regime switches in the VIX index with macroeconomic variables

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Abstract

In this article, we investigate the role of US macroeconomic variables as leading indicators of regime shifts in the VIX index using a regime-switching approach. We find that there are three distinct regimes in the VIX index during the 1990 to 2010 period: tranquil regime with low volatility, turmoil regime with high volatility and crisis regime with extremely high volatility. We also show that the regime shift from the tranquil to the turmoil regime is significantly predicted by lower term spreads.

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Notes

[1]One closely related study is of Chen and Clements (2007), who investigate the impact of monetary policy announcement on the VIX index, although they do not investigate regime switches.

[2]The structural breaks are detected by minimizing the sum of squared errors of each partitioned period.

[3]Bussiere and Fratzscher (2006) suggest the usefulness of a regime-switching approach in the early warning system model because it can determine the timing and the length of different regimes endogenously.

[4]For a robustness check, we also estimated three-regime-switching model without this restriction. We conducted likelihood ratio test and found that the model without the restriction did not significantly outperform the model with the restriction at the 5% level.

[5]All the macroeconomic variables are obtained from Bloomberg.