

Wavelet Analysis of Index Prices in Futures and Cash Markets: Implication for the Cost-Of-Carry Model

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Prices in spot and futures markets are contemporaneously related according to the theoretical Cost-Of-Carry (COC) model. In the literature, on the other hand, futures index price changes are usually found to lead spot index prices changes by up to forty-five minutes. This empirical evidence, which confirms a non-contemporaneous relationship between price changes, has been argued to have implications for price discovery in both markets, as well as putting in questions for the validity of the COC model. However, we note that it is price, rather than price change (or return), that is the variable of interest in the COC model. Price changes are used in the empirical studies, possibly because both spot and futures index prices are subject to the same impact from changes in market fundamentals and hence are cointegrated with each other.

In this paper, it is shown how one can employ the wavelet analysis to reconstruct price series based only on a subset of information that differentiates the two fundamentally related prices. Such an analysis not only allows a focus on examining prices, but also enables examination and comparison of reconstructed prices based on different levels of information detail. It is found that the lead-lag relationship still exists between spot and futures index prices. Such a relationship is more persistent when more detailed information is used for price reconstruction. The implication of this result is that, if market imperfection is to be blamed for the non-contemporaneous relationship between index prices from the two markets, one should only concentrate on those imperfections that are likely to occur within very short time horizons.

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