Correlation Dynamics Between International Stock Markets Using Synchronous Data

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International stock markets have different trading hours. Hence, using close-to-close prices will result in non-synchronous returns. Several proposals have been made in the literature for dealing with this non-synchroneity problem when computing covariance and correlation from daily data. In this study we use synchronous daily stock market prices recorded at 16:00 London time for the US, UK and France to evaluate the effectiveness of these proposals in correcting data non-synchroneity, and to study *daily* correlation dynamics.

Analyses based on daily synchronous data suggest that there is no significant lead-lag relationship between the US and the two European countries at the returns level. Results from fitting an Asymmetric Dynamic Covariance (ADC) Model (Kroner and Ng (1998)) indicate that US shocks have a significant impact on both UK and French variances. The asymmetry effect, i.e. negative returns having a different impact from positive returns, is present not only in the variances but also in the covariances. Covariance increases more in bear market.

We found the correlation dynamics to be different when computed from nonsynchronous closing prices, even though these prices are adjusted for non-synchroneity based on the recommendations in Riskinetrics^{TM} and Bums, Engle and Mezirich (1998). For all cases the correlation between the synchronous and synchronized correlation measures is lower than 0.5, the average difference exceeds 0.05, and for Riskmetrics the synchronized correlations sometimes exceed 1. On the other hand, the correlation between the synchronous and synchronized *covariance* measures always exceeds 0.88 in our sample period, which explains why synchronized Value-at-Risk (VaR) measures are as good as VaR measures based on synchronous data.

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