Discussion of

Robert Engle and Jose Gonzalo Rangel
"High and Low Frequency Correlations in Global Equity Markets"

and

Xilong Chen and Eric Ghysels
"News and its Impact on Volatility Forecasts before and during the Financial Crisis"

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Correlation trading has always struck me as a nutty exercise. Who knows whether 0.1, 0.5 or 0.8 is a low correlation or a high correlation for an index tranche? If 3%-6% has an implied correlation of 0.7 and 6%-9% has an implied correlation of 0.3, that does not tell me that the lower tranche is somehow expensive, because I dont believe the model. Correlation traders develop intuition about these numbers, but is it any different from the intuition of astrologers?

More generally, I think the golden age of nancial engineering has come to an end. (Of course, universities will continue to teach it for a generation, because students wont gure out that its over until its too late.) US sub- prime is only one example.

Engle and Rangel

Unconditional factor model

$$r_t = \mathcal{E}_{t-1} r_t + BF_t + u_t$$

$$\mathcal{E} F_t = \mathcal{E} u_t = 0$$

$$\text{Cov}\, F_t F_t' = \Sigma_F$$

$$\text{Cov}\, u_t u_t' = \Sigma_u$$

$$\text{Cov}\, F_t u_t' = 0$$

Implication

$$\text{Var}\, r_t r_t' = B \Sigma_F B' + \Sigma_u$$

Engle and Rangel

Conditional factor model

$$\text{Var}_{t-1}\, r_t r_t' = B\Sigma_{F_t}B' + \Sigma_{u_t} + B(\mathcal{E}_{t-1}F_t u_t' + \mathcal{E}_{t-1}u_t F_t')B'$$

$$\Sigma_{F_t} = \mathcal{E}_{t-1}F_t F_t'$$

$$\Sigma_{u_t} = \mathcal{E}_{t-1}u_t u_t'$$

First two terms due to by latent factors; last two due to correlation of error term with factors.

Fleshed out with an intricate specification from Engle and Rangel (2008).

Define low frequency contribution by mean reversion of random effects termed high frequency components.

Engle and Rangel

Synchronization of markets that are open at different times is achieved by forecasting what would have happened had they been opened. Method is in Burns, Engle, Mezrich (1998)

Method 1 synchronizes then fits conditional correlation model

Method 2 determines B from a model in leads and lags implied by model, estimate innovations, synchronize, fit DCC, combine terms.

Engle and Rangel

Main implication of Table 1 is that there are far more stock markets than could possibly be necessary.

Table 1 also suggests a (possibly) better approach.

U.S. is excluded, why?

Engle and Rangel

Application is with weekly and daily data.

Results agree well with a model free approach that uses low frequency data.

The incorporation of synchronization allows the use of daily data and seems effective.

Chen and Ghysels

The basic idea is not to start behaving differently when time increments become small.

Entertain the the same sort of models that one might consider for daily returns for data sampled at higher frequency.

The time increment is i/M

$$r_{t-1+i/M} = \log(P_{t-1+i/M}) - \log(P_{t-1+(i-1)/M})$$

$$r_{t-1} \text{ is when } i = 0$$

$$r_t \text{ is when } i = M$$

Chen and Ghysels

The model is

$$\mathrm{RV}_t = \sum_{j=1}^{\tau} \sum_{i=1}^{M} \psi_{ij}(\theta) m(r_{t-j-(i-1)M}) + e_t$$

where (next slide)

Chen and Ghysels

$m(r)$, called the news impact curve, is yet to be determined. Think of things like $m(x) = ax + b|x|$ for $m(x)$.

$\psi_{ij}(\theta) = \psi_i(\theta)\psi_j(\theta)$ is a lag distribution. The $\psi_i(\theta)$ part corrects for diurnal patterns in high frequency returns.

Asymptotic properties for this class of models are established under stationarity and mixing conditions with extensions to seasonal processes using a standard stacking strategy from the statistics literature.

Notation is unstable. Slides and paper differ. E.g., $\psi_i(\theta)$ is sometimes $b_i(\theta)$ and $m(r)$ sometimes NIC(x).

Chen and Ghysels

Extensive empirical work supports the contention that not imposing symmetry on $m(r)$ is beneficial.

Merton Miller may have been correct: The study of continuous time methods is largely a waste of time. Discrete time methods work better.