Realizing Commodity Correlations

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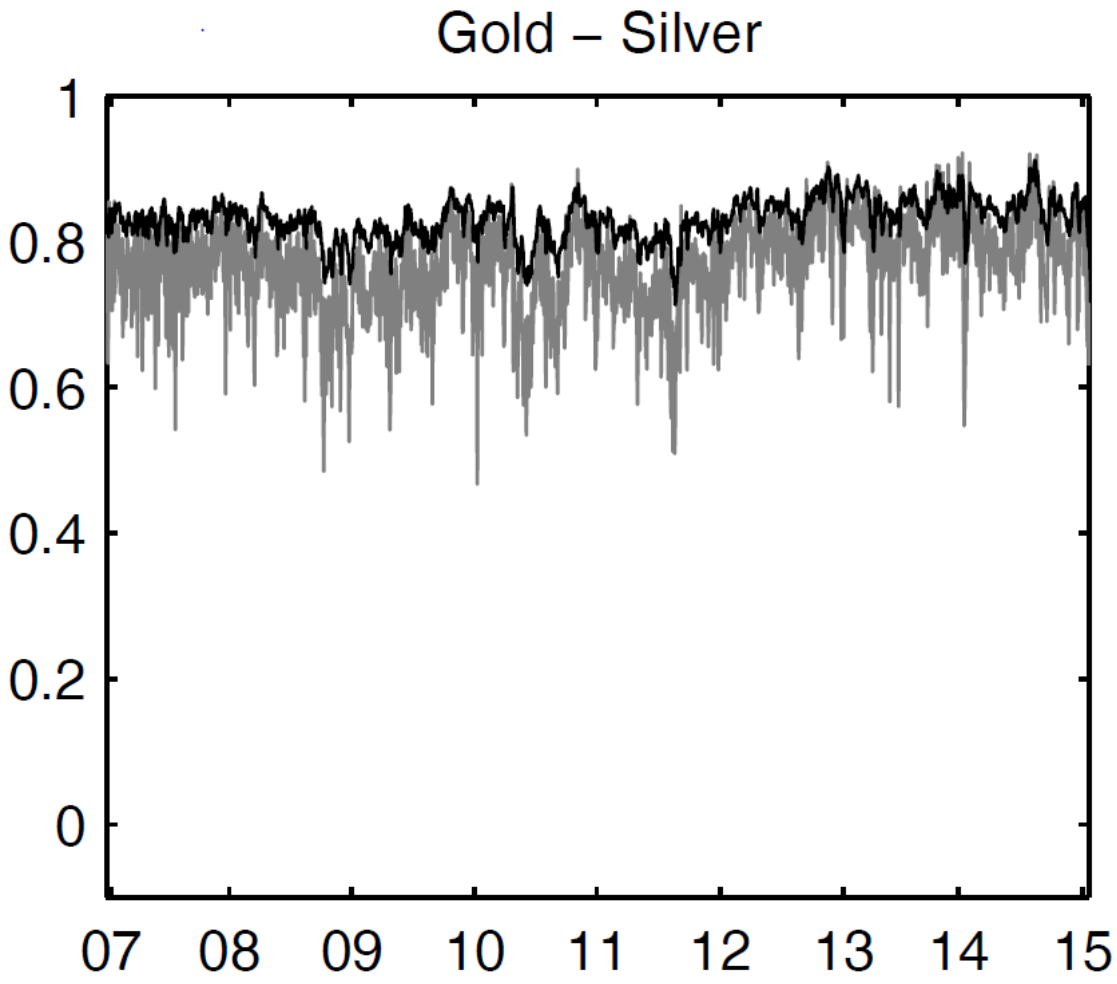
Overview

- This paper presents an exciting early look at the dynamics of correlations between different commodities
- The presentation (and next version of the paper) covers a possibly even more interesting look at the dynamics of correlations between commodities and financial asset returns
- The authors find substantial evidence of time-varying correlations, and consider some state-of-art dynamic models for capturing this time variation.

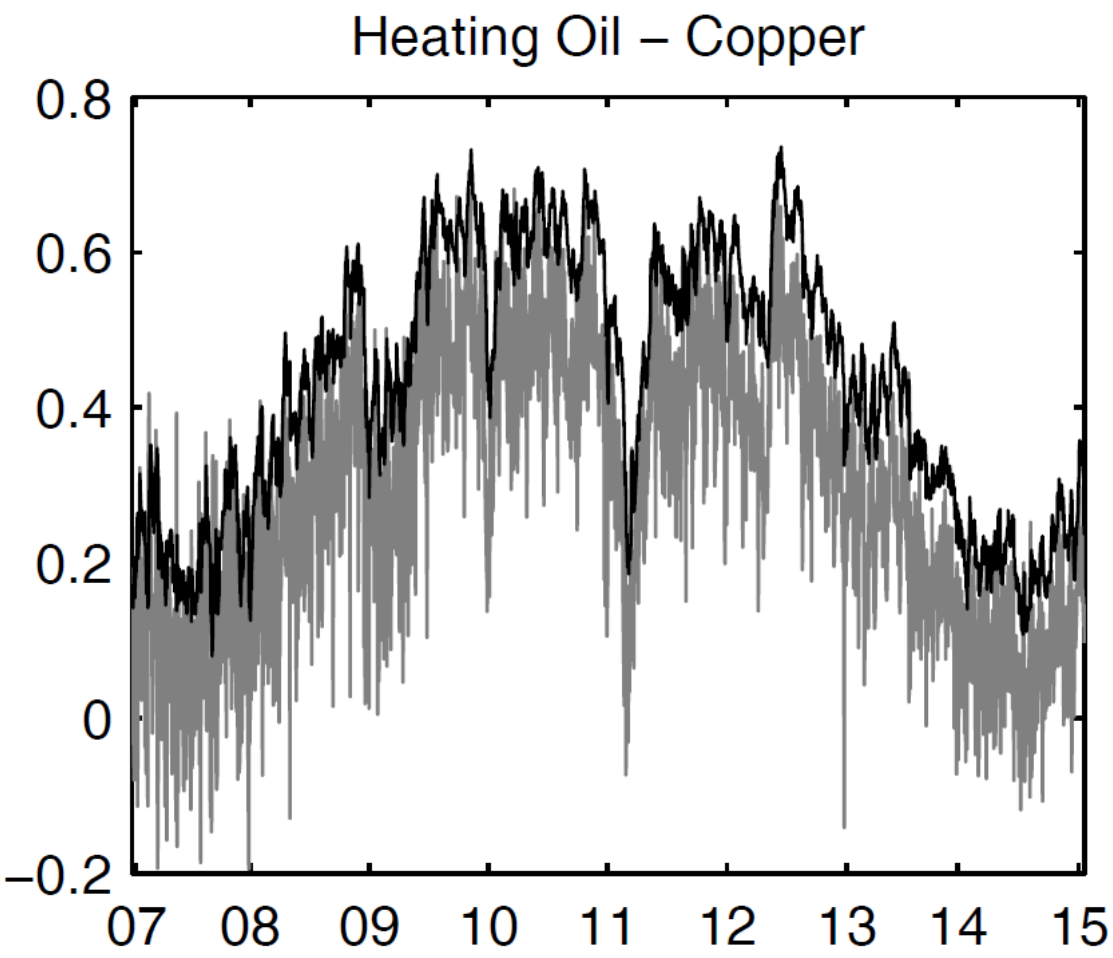
Correlation dynamics for Gold and Silver returns

This pair has very little dynamics: correlation is high and stable.



Correlation dynamics for Heating Oil and Copper returns

This pair has a lot of correlation dynamics: ranging from around 0.1 to 0.7.



Some comments on the paper

- I like the paper, and I learned some new things about commodity returns by reading it.
- My comments are mainly just questions so that I can learn even more from the next version.

Market microstructure for commodity futures markets

- The authors give some summary statistics on the high frequency data they use, but not too much.
- The authors use 15-minute sampling, writing that this is a conservative choice and that microstructure effects are immaterial at that frequency.
  - We know from existing work on liquid equity and FX markets that this is true
  - I do not know whether it is true for commodity markets:
  - Different institutional features, (possibly) different market participants, different constraints, etc.
- I would like to see more analysis of the microstructure aspects of these markets, to be reassured that things we think we know about high frequency financial markets also apply to commodity futures markets.

Goodness-of-fit tests for the variance & correlation models

- Tests (like the model confidence set) to compare the different models for correlations are given, and these are indeed useful.
  - Which models are better/worse than the others?
- Since these data are so new, I would also be interested in *goodness-of-fit* tests.
  - Is a given model rejected by the data?
- Commodity returns data are relatively new, and so we do not know yet what features of the data need to be modeled
  - Is asymmetry in the volatility model important?
  - Is a "(1,1)" lag structure sufficient, or do we need more lags? etc.

The Gaussian assumption for standardized returns

- The authors use a Gaussian assumption for standardized residuals
- Is this plausible for this data? It is claimed so, but references given were for equity/FX returns, and I do not know whether this is also true for commodity futures returns

✓ Estimation by ML can be re-interpreted as QML if Gaussianity is violated

✓ Comparison of predictive densities can be re-interpreted as comparing covariance matrices using QLIKE

× Simulation approach based on Gaussianity cannot be re-interpreted – would need to use a bootstrap-type method instead.

Asymmetric dependence

- This paper focuses on the correlations between the different commodity returns — a reasonable place to start.
- We know that equity returns exhibit *asymmetric dependence*: dependence tends to be stronger for negative returns than positive returns.
  - Is this also true for commodities?
  - Has this feature become more pronounced since the "financialization" of commodities?
  - Is this feature more prominent for equity-commodity correlations than for commodity-commodity correlations?