

A High-Low Model of Daily Stock Price Ranges

Yan-Leung Cheung

City University of Hong Kong

and

Yin-Wong Cheung

University of California, Santa Cruz

Hong Kong Institute for Monetary Research

and

Alan T. K. Wan

City University of Hong Kong

January 2009

Summary

In this exercise we exploit the observation that daily highs and lows of stock prices do not diverge over time and, hence, infer that daily highs, daily lows, and their associated daily ranges are interlinked. An empirical model known as the vector error correction model (VECM) is, thus, employed to describe the joint-dependence of highs, lows, and ranges. Our empirical results attest to the relevance of modeling the three variables simultaneously and the importance of incorporating high-low interactions in modeling the range variable. The in-sample performance of the VECM is quite good. The VECM also offers some desirable forecasts. For instance, it is shown that the joint estimation improves the performance of the high and low forecasts. Depending on the choice of evaluation criteria, the VECM-based range forecast can be better or worse than other alternative forecasts. The use of the proposed model to forecast implied volatility also yields some encouraging results. Putting all these together, the in-sample results are more supportive of the VECM specification than the out-of-sample results.