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MIDAS Regressions: Further Results and New Directions

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ABSTRACT: We explore Mixed Data Sampling (MIDAS) regression models. The regressions involve time series data sampled at different frequencies. Volatility and related processes are our prime focus, though the regression method has wider applications in macroeconomics and finance, among other areas. The regressions combine recent developments regarding estimation of volatility and not so recent literature on distributed lag models. We study various lag structures to parameterize parsimoniously the regressions and relate them to existing models. We also propose several new extensions of the MIDAS framework. The paper concludes with two empirical sections where we provide further evidence and new results on the risk-return tradeoff and volatility forecasting in microstructure noise environment. We find a positive and significant relationship between risk and return using high-frequency DJ data sample covering 1993-2003 years. Analysis based on AA and MSFT stocks shows that the unadjusted measures of realized volatility and power variation are the best predictors over most unadjusted and adjusted measures of realized volatility.

Estimation of Large Covariance Matrices for Risk Management Purpose.

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ABSTRACT: The estimation and forecast of the volatility matrix are two of the main tasks of financial econometrics since they are the essential ingredients in many practical applications. However, the application of classical multivariate methods to large dimensions is hampered by "the curse of dimensionality". In this study I propose two methods, a multivariate factor MIDAS and Dynamic Conditional Correlation (DCC) MIDAS models, that offer a solution to the dimensionality problem and utilize intraperiod information. The paper extends the univariate MIDAS-based volatility model introduced by Ghysels, Santa-Clara and Valkanov (2007). Using twenty-two DJ stocks and Monte Carlo simulations I evaluate the performance of the two proposed models and compare it to the performance of the DCC-GARCH and Factor GARCH models. The results show that the MIDAS DCC and multivariate factor MIDAS models perform better than DCC GARCH and Factor GARCH and their performance improves as the number of assets increases. These findings are supported by Monte Carlo simulations.

MIDAS The impact of news on the cross section of stock returns.
(work in progress)

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ABSTRACT: We investigate the response of daily U.S. firm returns to macroeconomic and firm-specific shocks. Because daily firm returns are inherently noisy, most previous papers that link economic fluctuations to stock returns do so at the market (or some other aggregate) level. We address the noise issue by parameterizing the response to news as a parsimonious, flexible and simple function. The parameterization has two goals; it shrinks the noisy responses by implicitly imposing smoothness constraints and also reduces the number of coefficients to estimate. We find that, following macroeconomic news: (i) small firms respond

the most and large firms the least to all surprises with the exception of monetary policy shocks; (ii) large firms respond the most and small firms the least to monetary policy shocks; (iii) unemployment news significantly affect the highest book-to-market firms, which is consistent with the claim that return comovements in highly leveraged companies is linked to human capital; (iv) several other firm characteristics (idiosyncratic risk, disagreement about earnings forecasts) are also important in understand the response of firm returns. Following earnings announcement shocks, we also find that: (i) returns of large companies are more sensitive than those of small companies; (ii) returns of firms with high idiosyncratic risk are less responsive to earnings news; (iii) other characteristics (book-to-market, disagreement about earnings forecasts, etc.) explain surprisingly little of the post-announcement return variation.

Volatility Forecasting and Microstructure Noise.

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ABSTRACT: It is common practice to use the sum of frequently sampled squared returns to estimate volatility, yielding so called realized volatility. Unfortunately, returns are contaminated by market microstructure noise. Several noise-corrected realized volatility measures have been proposed. We assess to what extend correction for microstructure noise improves forecasting future volatility using the MIxed DAta Sampling (MIDAS) framework. We start by studying the population properties of predictions using various realized volatility measures. We do this in a general regression setting and with both i.i.d. as well as depend microstructure noise. Next we study optimal sampling issues theoretically, when the objective is forecasting and microstructure noise contaminates realized volatility. For the volatility measures constructed using five-minute returns, microstructure corrections tend to reduce predictability. The subsampling and averaging class of estimators (Zhang, Mykland, and Ait-Sahalia 2005) predicts volatility the best at this frequency. In particular, a new power variation estimator constructed by averaging over subsamples has the best performance. This result reinforces earlier findings of (Ghysels, Santa-Clara, and Valkanov 2006) and Forsberg and Ghysels (2004). Finally, the volatility dynamics are more complicated for one-minute returns and the results are not that clear-cut. Moreover, when we study optimal sampling empirically, we find its implementation hampered by the requirement to estimate fourth order moments.