

Conditional jumps in volatility and their economic determinants

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The volatility of financial returns is affected by rapid and large increments. Such movements can be hardly generated by a pure diffusive process for stochastic volatility. On the contrary jumps in volatility are important because they allow for rapid increases, like those observed during stock market crashes. We propose an extension of HAR model for estimating the presence of jumps in volatility, using the realized-range measure as a volatility proxy. By focusing on a set of 36 NYSE stocks, we show that, once that squared jumps in prices are disentangled from integrated variance, then there is a positive probability of jumps in volatility, conditional on the past information set. We then focus on the contribution of jumps during periods of financial turmoil. We analyze the dependence between the first principal component of the volatility jumps with a set of financial covariates including VIX, S&P500 volume, CDS, and Federal Fund rates. We observe that CDS captures large part of the expected jumps moves, verifying the common interpretation that large and sudden increases in volatility in stock markets over some days in the recent financial crisis have been caused by credit deterioration of US bank sector. Finally, we extend the model incorporating the credit-default swap in the dynamics of the jump size and intensity. The estimates confirm the significant contribution of the credit-default swap to the dynamics of the volatility jump size.