Chapter 11

Asset Price Density Forecasting for the Financial Sector: An Investigation of the Liquidity Effect of Volatility Forecasting

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ABSTRACT

The predictive accuracy of challenging financial sector price forecast densities and the effect of liquidity are investigated for the 1990 to 2013 period. The author uses the EGARCH model to capture leverage and persistence effect. Coefficient estimations have been done until the last trading day of 2005. The output indicates that leverage and persistence effects are significant for almost all of the financial institutions. Liquidity term is only significant for some of the institutions. Normality and autocorrelation of the data have been tested and it is found that data violates i.i.d assumptions. Two distributions that are Gaussian and student t have been tested to forecast future volatility. Accuracy of two models is investigated for out-of-sample data, which starts from 01/01/2006. Out of Sample Log Likelihood and Weighted Log Likelihood ratios have been used to rank models. The author finds that the EGARCH model with Gaussian distribution performs better than alternative model for both of the ranking tests. The findings related in this chapter are unexpected in that Gaussian distribution has better performance than student t distribution.

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1. INTRODUCTION

Forecasting is known as the estimation of the value of a random variable at some future point in time. Having idea about the future is precious for investors, policy makers and institutions. Their investment and expectations are shaped by the forecasts that are done depending on the available historical information. Reliable forecasts nowadays attract the people who are eager to invest in uncertainty.

Forecasting is a progression of predicting or estimating the future based on available past and present information. Forecasting furnishes information about the potential future events and their consequences for the institutions. It may not reduce the difficulties and uncertainty of the future. However, it increases the confidence of the institutions to make brave decisions.

Prediction of future prices brings about several problems. According to Taylor (2005, p. 2), there are 3 different problems that forecasting leads to. The first major problem is to answer the question of which direction does the prices go. Efficient market hypothesis claims that prices follow random walk, and it is difficult to gain satisfactory information about the future prices. The second problem is to respond that how volatile will the prices be in the future? It is controversial question to answer for the extreme situations. Econometricians can forecast future price densities however it is more likely to fail in the unexpected situations including market crashes. The third problem is to create entire probability distribution of price for several times. Taylor (2005, p. 2) suggests eliminating it via Monte Carlo experiment.

Forecasting is divided in to two parts. The first one is density forecasting and the other one is point forecasting. Density forecasting is an estimation of future distribution of a random variable depending on the available information. In an example what is the probability that an asset price will decrease more than 10% during the next month? On the other hand, point forecasting only focuses on expected value of a random variable in the future.

In the forecasting, investors have different concerns and distinct desires of the forecasts. So, forecast producers need to recognize the desires of the target investors and presents appropriate forecasts. For example, for point forecasting, an investor who decides via conditional mean point forecast with asymmetric loss function is likely to end up with sub optimal decision. Density forecasting overcomes sub optimal decision because; density forecasts are a complete description of the uncertainty linked to the forecast of a variable. However, having a complete density without missing any vital information is hard task to deal. In other words, it is almost impossible to forecast a density that consists of all of the significant information.

Financial market volatility might have wide influence on the economy. It is known that political incidents affect financial market unswervingly. The terrorist attack on September 11 and 2009 financial reporting scandals in United States lead to chaos in financial markets. The chaos did not only affect the United States market, it had significant impact on the rest of the world as well. Financial turmoil also disturbed the world economy. These events represent the crucial linkage between public confidence and financial market uncertainty. To reduce the unexpected effect of these kinds of actions, policy makers always consider the estimation of volatility as a measurement. As an illustration, the Bank of England frequently quotes to market sentiment and option implied densities of key financial variables, including oil, in its regular monetary policy meetings.¹

Financial institution is a foundation that focuses on dealing with financial transactions such as investments, loans and deposits. Typically financial institutions are composed of organizations some of which include banks, trust companies, insurance companies and investment banks. Almost everyone is supposed to deal with financial institutions in regular base. Everything from lending money to
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