

## The Role of Macroeconomic Condition and Volatility in Credit Risk: An Empirical Analysis of Credit Default Swap Index Spread on Structural Models in U.S. Market during Post-Crisis Period

**Authors :** Xu Wang

**Abstract :** This research builds linear regressions of U.S. macroeconomic condition and volatility measures in the investment grade and high yield Credit Default Swap index spreads using monthly data from March 2009 to July 2016, to study the relationship between different dimensions of macroeconomy and overall credit risk quality. The most significant contribution of this research is systematically examining individual and joint effects of macroeconomic condition and volatility on CDX spreads by including macroeconomic time series that captures different dimensions of the U.S. economy. The industrial production index growth, non-farm payroll growth, consumer price index growth, 3-month treasury rate and consumer sentiment are introduced to capture the condition of real economic activity, employment, inflation, monetary policy and risk aversion respectively. The conditional variance of the macroeconomic series is constructed using ARMA-GARCH model and is used to measure macroeconomic volatility. The linear regression model is conducted to capture relationships between monthly average CDX spreads and macroeconomic variables. The Newey-West estimator is used to control for autocorrelation and heteroskedasticity in error terms. Furthermore, the sensitivity factor analysis and standardized coefficients analysis are conducted to compare the sensitivity of CDX spreads to different macroeconomic variables and to compare relative effects of macroeconomic condition versus macroeconomic uncertainty respectively. This research shows that macroeconomic condition can have a negative effect on CDX spread while macroeconomic volatility has a positive effect on determining CDX spread. Macroeconomic condition and volatility variables can jointly explain more than 70% of the whole variation of the CDX spread. In addition, sensitivity factor analysis shows that the CDX spread is the most sensitive to Consumer Sentiment index. Finally, the standardized coefficients analysis shows that both macroeconomic condition and volatility variables are important in determining CDX spread but macroeconomic condition category of variables have more relative importance in determining CDX spread than macroeconomic volatility category of variables. This research shows that the CDX spread can reflect the individual and joint effects of macroeconomic condition and volatility, which suggests that individual investors or government should carefully regard CDX spread as a measure of overall credit risk because the CDX spread is influenced by macroeconomy. In addition, the significance of macroeconomic condition and volatility variables, such as Non-farm Payroll growth rate and Industrial Production Index growth volatility suggests that the government, should pay more attention to the overall credit quality in the market when macroeconomy is low or volatile.

**Keywords :** autoregressive moving average model, credit spread puzzle, credit default swap spread, generalized autoregressive conditional heteroskedasticity model, macroeconomic conditions, macroeconomic uncertainty

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