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As the global economies begin to recover from one of the worst financial crisis in history, researchers in the industry and academia are searching for ways to prepare for and prevent similar disasters from happening in the future. But what really went wrong? Through all forms of media, people have directed the blame for this crisis on the mortgage companies, investment banks, subprime mortgage holders, SEC, the Federal Bank, etc. However, in our capitalist economy where everything in society is so delicately intertwined together, it is less important to find the cause of the crisis and more important to find ways to manage and measure risk.

One risk that has prevailed in the markets throughout the crisis is the sudden decrease of liquidity that the credit derivatives market displayed, especially in credit default swaps. Credit default swaps (CDSs) are contracts where one party buys protection from another party against a default event in the underlying company. Essentially, it is very similar to an auto insurance contract, but with protection against defaults events on a firm such as Walmart, instead of a car accident. During the past year, we have been developing a mathematical model that is capable of adjusting the price of a CDS for the current and future levels of liquidity. To accomplish this a random time, where the protection buyer or seller trades the CDS in the future, is considered and included in the cash flow payments of the CDS. This allows for the liquidity in the future to be considered and allows one to properly calculate the necessary adjustment on the CDS price. This is important because it allows firms investing in CDSs to manage their risks more efficiently.

This research is still ongoing, but the important step of integrating the current and future liquidity into the price is completed. The next steps that need to be carried out are to specify stochastic models for the underlying parameters such as the trading and default intensities, and the liquidity process. Further, I need to numerically calibrate the model to real market data, produce the adjusted CDS price, and compare the results with past models.

If firms invested in the market become more efficient at managing and measuring risk, there would be less of a need to regulate the markets and for government intervention, and the risk of having another major financial crisis in the future would decrease. I hope that our research in CDS pricing will help investors in this endeavor, and markets achieve more efficiency. I am very thankful for having the opportunity to research this very interesting topic with funding provided by the IIT Research Scholarship. I look forward to continuing my research at the IIT applied mathematics department alongside some of the brightest faculty in the mathematical finance field.