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Essays on Disaster Risk in Asset Pricing

The majority of my work consists of asset pricing under disaster risk, an area which has been popularized by the recent financial crisis. In particular, my research focuses on explaining the equity premium puzzle, or the fact that standard macroeconomic models cannot account for a relatively high return on stocks compared to the return on bills by assuming a reasonable level of risk aversion. My work suggests that the majority of the puzzle can be explained by disasters, i.e., low-probability events with disastrous consequences such as the Great Depression. My job market paper, takes a theoretical approach and introduces disasters into the consumption process to explain the equity premium puzzle in developing and high-income countries. In the second paper, I follow a more empirical approach and use options data on the S&P 500 index to assess the contribution of disasters to the U.S. equity risk premium.

In my job market paper, *Equity Premium Puzzle in High-Income and Developing Countries: An Empirical Approach with Disasters*, I use annual consumption and financial data for 31 countries over 140 years to document that developing countries exhibit more volatile consumption and a significantly larger equity premium. By employing a Bayesian Markov Chain Monte Carlo approach, I estimate an empirical model of disasters in developing and high-income countries to account for possible differences in disaster parameters between the two groups of countries. I find that developing countries have a higher overall probability of entering a disaster. Developing countries are also much more likely to enter a disaster on their own such as a sovereign debt crisis. Disasters in high-income countries are shown to be shorter, on average, but more severe and uncertain. Group heterogeneity in disaster parameters allows me to generate a substantial equity premium for both groups of countries. Disaster contagion plays a vital role in explaining the equity premium puzzle for high-income countries. The model-simulated correlations of equity premium within each group of countries are qualitatively in line with data.

One critique of the disaster approach is that it relies on international evidence, but the U.S. economy is much more tranquil than economies throughout the rest of the world. For this reason, my other paper called *Isolating the Disaster Risk Premium with Equity Index Options* examines the contribution of disaster risk to the U.S. equity risk premium. I provide evidence that the U.S. stock market returns not only exhibit large negative skewness, but that they also provide poor payoffs during deep consumption recessions. Using out-of-the-money S&P 500 index options, I obtain a hedged risk premium and show that the hedged risk premium captures the equity risk premium during normal times. I isolate the disaster risk premium as the difference between the total equity risk premium and the hedged risk premium. In addition, I illustrate that the risk premium due to disasters explains about eighty percent of the total equity risk premium. In the cross-section of stock returns, I find that stocks that are more negatively related to the disaster risk premium yield considerably higher subsequent returns. However, this finding is not robust to adjusting for Fama-French price factors. I also find little predictive power of the disaster risk premium with respect to the aggregate stock market returns due to the lack of autocorrelation in the disaster risk premium.

In my future work, I plan to introduce disasters into a small open economy with production to explain two anomalies observed in emerging countries: more volatile consumption relative to output and countercyclical net exports. I intend to model disasters as an unfavorable shock to productivity and capital. For the calibration of disasters, I will utilize the novel empirical estimates of disaster parameters for developing countries reported in my job market paper. Disasters will allow me to study the joint implications of the disaster risk on asset prices and economic quantities, and introducing disasters into this environment may yield a productive approach to explain business cycle and asset market anomalies in emerging countries.