# Preliminary Proposal, Topic Overview, and Research Question

ECON 4008-01: Macro-Modeling

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## 1. Research Motivation and Topic

Nearly a decade ago, peer to peer payment networks and digital currencies were unknown to virtual communities and the general population. Cryptocurrencies including Bitcoin, LiteCoin, and DogeCoin became household names and grasped the attention of investors, analysts, and economists in 2016. Bitcoin's anonymous users and encrypted transactions made it the most prominent of virtual currencies. At its inception, Bitcoin traded at $0.63 per Bitcoin, and by 2014 its value peaked at $1,101.65 per Bitcoin. By November 20, 2017, its price was recorded at a record high of $8,237.45 and increased over 111.19% in the 15 preceding weeks. However, its price today is less than half of that record value.[1] The fundamental determinants of Bitcoin's price include supply and demand interactions, individuals' expectations, and the development of technological instruments used for conducting Bitcoin transactions.

Unlike standard fiat money, Bitcoin is not within the domain of central governments, authorities, or individuals. The supply and demand for most monetary units are driven by macroeconomic variables which include interest rates, inflation, and the actions taken by central authorities. However, significant changes in the price of Bitcoin are attributable to specific factors relating to cryptocurrencies. Since Bitcoin's supply evolves according to a publicly known algorithm and is fairly inelastic, and the demand side of the market is mainly driven by the expectations of investors who plan on holding the currency and later selling it, Bitcoin has an exceptionally volatile behavior which makes it an extremely risky yet profitable investment. Its market performance includes steep increases and precipitous declines in value further suggesting the market is driven by the expectations of investors and spectators.

[1] "Bitcoin Price." Bitcoin., accessed Nov 20, 2017, https://charts.bitcoin.com/chart/price.

## 2. Research Question

This empirical work seeks to analyze the shock process of Bitcoin as well as the shock process of relatively risk free U.S. Treasury Bills (i.e. to answer the following question: What is the shock process of Bitcoin and the shock process of a relatively risk free U.S. Treasury Bill?). Furthermore, this study seeks to examine the risk aversion parameter necessary to generate the level of equity return observed in the historical price data of Bitcoin and U.S. Treasury Bills (i.e. to answer the following question: What is the risk aversion parameter necessary to generate the level of equity return observed in historical price data of Bitcoin and U.S. Treasury Bills?). Traditionally, studies that replicate the equity premium puzzle with a Lucas Asset Pricing Model examine the excess returns of a risky security or index relative to those of risk free assets or treasury bonds. Until 2016, cryptocurrencies were largely unacknowledged by academics. Although the volatile behavior of cryptocurrency is now at the forefront of many financial economic works, the risk premia necessary to hold cryptocurrencies are scantly studied.