Literature Review

ECON 4008-01: Macro-Modeling

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Robert Lucas (1978) examines the stochastic behavior of equilibrium prices in a representative, pure exchange, single good economy with identical consumers.[[1]](#footnote-1) According to Lucas, the general equilibrium and market clearing price for trees at time must satisfy the following: and . Furthermore, the equilibrium price of the asset must satisfy . Insert specifications about Lucas’s model. [[2]](#footnote-2)

Subsequent to the publication of the Lucas Asset Pricing Model, Mehra and Prescott (1985) present the equity premium puzzle. They find that in a competitive pure exchange economy, the average annual yield of equity is, at most, four-tenths of a percent higher than that of short term debt. In stark contrast, the historical yield observed by Mehra and Prescott has a premium of six percent when accounting for U.S. business cycle fluctuations and reasonable risk aversion levels. They conclude that the historical U.S. equity premium, the return earned by a risky security in excess of that earned by a relatively risk free U.S. Treasury Bill, is not only irrational but also inexplicable.[[3]](#footnote-3) According to Nada (2013), the economies used in Mehra and Prescott’s study have a “stationary equilibrium for growth rate process on consumption as well as returns”[[4]](#footnote-4). Nada maintains that the elasticity of substitution between consumption in time period and time period is sufficiently small to yield a six percent average premium, but the magnitude of the covariance between the marginal utility of consumption and equity returns is not sufficiently large enough to justify the equity premium observed. Mehra and Prescott’s equity premium puzzle ignited an extensive research effort within the fields of macroeconomics and finance. A plethora of theoretical speculations and plausible explanations for this anomaly have been presented, but no single solution has been widely accepted by economists.

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. Although virtual currencies resemble the role of money and create an alternative environment for conducting business, it was not until 2016 that cryptocurrencies were unacknowledged by academics. According to Vandezande (2017), cryptocurrencies have the highest risk among all types of virtual currencies. He maintains that investors are not fully informed about the risk relating to cryptocurrency investments due to the absence of regulatory bodies and the enforcement of protection mechanisms[[5]](#footnote-5). Thus, it is increasingly important to analyze the behavior of cryptocurrencies as financial tools. While the volatile behavior of cryptocurrency is now at the forefront of many financial economic works, there are few explanations for the current behavior of cryptocurrencies as investment tools, and the risk premia necessary to hold cryptocurrencies are scantly studied.

Much of the financial literature contains ambiguous results concerning the behavior of cryptocurrencies. Thus, the debate about whether cryptocurrencies are a speculative investment asset or a currency remains ongoing. Corbet, Meegan, et al. (2018) examine the relationships between cryptocurrencies and other financial assets with the Diebold and Yilmaz methodology[[6]](#footnote-6), Barunik and Krehlik methodology[[7]](#footnote-7), and a standard MVGARCH-DCC model. They hypothesize that, “cryptocurrency markets, i.e. Bitcoin, Ripple and Litecoin, are strongly interconnected, and demonstrate similar patterns of return and volatility transmission with other assets.”[[8]](#footnote-8) They study the return and volatility transmission among Bitcoin, Ripple, and Litecoin and further their research by studying the excess return and volatility transmission to gold, bond, equities, and the global volatility index (VIX). Their findings demonstrate that cryptocurrencies are relatively isolated from market shocks and decoupled from popular financial assets, despite the fact that the performance of each cryptocurrency is correlated to the performance of other cryptocurrencies. This suggests that cryptocurrencies can be effective tools for portfolio diversification. They also find that Bitcoin, Ripple, and Litecoin are highly sensitive to industry regulations and technological malfunctions. Thus, the interconnectedness among cryptocurrencies indicates that substantial changes in cryptocurrency prices are attributable to speculative activity.

Although cryptocurrencies may serve as useful portfolio diversifiers their returns do not behave similarly to standard asset classes.[[9]](#footnote-9) By implementing empirical asset pricing models and analyzing co-movements of Bitcoin, Ripple, Ethereum, stocks, currencies, commodities, macroeconomic factors, and cryptocurrency market specific factors Liu and Tsyvinski (2018) conclude that cryptocurrencies can be assessed using simple financial tools but behave in a radically different manner than traditional assets. Hence, only cryptocurrency market specific factors including momentum and investor attention consistently explain market returns.

# Bibliography

Barunik, Jozef, and Thomas Krehlik. 2016. *Measuring the frequency dynamics of financial and macroeconomic connectedness.*

Corbet, Shaen, Andrew Meegan, Charles Larkin, Brian Lucey, and Larisa Yarovaya. 2018. "Exploring the Dynamic Relationships between Cryptocurrencies and Other financial Assets." *Economics Letters.*

Francis, Diebold, and Kamil Yilmaz. 2012. "Better to give than to receive: Predictive directional measurement of volatility spillovers." *International Journal of Forecasting* 57-66.

Liu, Yukun, and Aleh Tsyvinski. 2018. "Risks and Returns of Cryptocurrency." *NBER Working Paper Series.* National Bureau of Economic Research, August.

Lucas, Robert E. 1978. "Asset Prices in an Exchange Economy." *Econometrica* 1429-1445.

Nada, Sara. 2013. "Equity Premium Puzzle: Not solved yet. ." *International Conference on Economics and Business Administration.* 48-61.

Prescott, Edward, and Rajnish Mehra. 1985. "The equity premium: A puzzle." *Journal of Monetary Economics* 145-161.

Vandezande, Niels. 2017. "Virtual currencies under EU anti-money laundering law." *Computer Law & Security Review* 341-353.

1. Lucas, Robert E. 1978. "Asset Prices in an Exchange Economy." *Econometrica* 1429-1445. [↑](#footnote-ref-1)
2. Ibid. [↑](#footnote-ref-2)
3. Prescott, Edward, and Rajnish Mehra. 1985. "The equity premium: A puzzle." *Journal of Monetary Economics* 145-161. [↑](#footnote-ref-3)
4. Nada, Sara. 2013. "Equity Premium Puzzle: Not solved yet. ." *International Conference on Economics and Business Administration.* 48-61. [↑](#footnote-ref-4)
5. Vandezande, Niels. 2017. "Virtual currencies under EU anti-money laundering law." *Computer Law & Security Review* 341-353. [↑](#footnote-ref-5)
6. Francis, Diebold, and Kamil Yilmaz. 2012. "Better to give than to receive: Predictive directional measurement of volatility spillovers." *International Journal of Forecasting* 57-66. [↑](#footnote-ref-6)
7. Barunik, Jozef, and Thomas Krehlik. 2016. *Measuring the frequency dynamics of financial and macroeconomic connectedness.* [↑](#footnote-ref-7)
8. Corbet, Shaen, Andrew Meegan, Charles Larkin, Brian Lucey, and Larisa Yarovaya. 2018. "Exploring the Dynamic Relationships between Cryptocurrencies and Other financial Assets." *Economics Letters.* [↑](#footnote-ref-8)
9. Liu, Yukun, and Aleh Tsyvinski. 2018. "Risks and Returns of Cryptocurrency." *NBER Working Paper Series.* National Bureau of Economic Research, August. [↑](#footnote-ref-9)