Literature Review of *Risks and Returns of Cryptocurrency* by Liu and Tsyvinski, 2018

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I. Introduction

This paper discusses the risk and return tradeoffs of cryptocurrencies. By using data from CoinDesk.com spanning over 2011 for Bitcoin, 2013 for Ripple and 2015 for Ethereum, to May 2018, the authors broadly answers three questions:

1. Can traditional equity market factors still have significant loadings in cryptocurrency market?;
2. If not, what unique factor loadings can be used to price cryptocurrencies and is there significant arbitrage opportunities?
3. What industry risk exposures could be used to price cryptocurrencies?

II. Return & Factor Loadings

- **No consistent evidence of equity market factor loadings in cryptocurrencies**: Most three cryptocurrencies do not exhibit significant factor loadings that are found significant in equity market. (Factors such as *MKTRF*, *SMB*, *HML*, *MOM*, *RMW* and *CMA*);
- **No consistent evidence of systematic currency exposures in cryptocurrencies**: Relationships between cryptocurrencies price and major global currencies are exhibited in Table 8 - 10 with AUD, CAD, EURO, SGD and GBP;
- **Most asset pricing factors do not show significant facto loadings**: 155 Factors from Feng, Giglio, and Xiu (2017) and Chen and Velikov (2017), only 4 are significant;
- **Macroeconomics factors do not show significant factor loadings.**

III. Unique Characteristics of Cryptocurrencies

- **Cryptocurrency Momentum**: Strong evidence of time series (daily and weekly) momentum. For Bitcoin daily returns, the current return positively and significantly predicts 1-day, 3-day, 5-day, and 6-day ahead returns. Arbitrage opportunities exist
- **Attention of Investors:**:
  - Google Search Volume: +, Arbitrage opportunities exists;
  - Post Mentions in Twitter: +, Arbitrage opportunities exists
  - "Bad News - Hacks": - Arbitrage opportunities exists
- **Price-to-"Dividend" and Volatility**: Gap between the market value and the fundamental value of an asset. Market Price is just observed price. The number of bitcoin wallet users is the proxy for fundamental values. Very weak relation is founded.
- **Supply Factors**: (1) Electricity: U.S. and China; (2) Computing Power: AMD, NVIDIA, TW...; no support for this hypothesis

IV. Industry Exposures

- **Industry Classification**: (1) FF-30 industry groups, (2) 354 SIC industries in the US; (3) 137 CIC industries in China;
- **Positive Relationship**:Consumer Goods and Healthcare industries are positively and statistically significantly affected while the Fabricated Products (FabPr)
- **Negative Relationship**: Metal Mining (Mines) industries are negatively and statistically significantly affected.
- **No/Weak Relationship**:And, the often mentioned Finance, Retail, and Wholesale industries have no statistically significant exposure.

IV. Quick Comments

1. As cryptocurrency markets are known to be speculative, which is very different from traditional equity market, it is unsurprising to find that common used factors fail to explain.
2. Momentum factor loading can be dominated by extreme periods when the Bitcoin price was rocketing. A robustness check excluding such periods is needed.
3. Attention measured by related posts from Google and Twitter are great proxies. Yet, they are ex post proxies. If attention plus sentiment is combined, higher return is expected.
4. The final section about industry risk exposure analysis seems to be redundant and unnecessary. More like cherry picking.

Thanks