

Zero Theorem Literature Review

“The Determinants of Price Discovery on Bitcoin Markets, O.
Entrop, B. Frijns, M. Seruset, 2020”

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Highlights

- Implementing a 2SLS time series technique to identify the determinants of price discovery on bitcoin markets.
- Understanding the working of proposed methodology that address all limitations regarding price discovery.

Background

With the advancement in technology, Crypto and Bitcoin are growing exponentially. Hence, this increasing attention bring some alarming problems which include trade-value of bitcoin along with the impact of the market trend on bitcoin, and price estimation between trading platforms. However, the bitcoin price determination process is a major concern that remains quite challenging issue that needs to be addressed. Limited studies have been done in this context that identified which market will lead the bitcoins cost revelation process along with the market factors that needs to be considered while determining the cost. Therefore, there is a need to investigate the market quality and uncertainty that affects the BitCoin price discovery along with its determinants.

Introduction

In this context, [Entrop et al. \(2020\)](#) focus on evaluating bitcoin price on the future market using daily transaction data with subject to time variation and the impact of market quality. For this purpose, a 2SLS time series regression is implemented to control the relation between price discovery and market trading cost and to bring positive change. Furthermore, to analyze dynamics of price discovery process, vector error correction model (VECM) is applied that deals with non-stationary prices which are subjected to time series.

Methodology

The working methodology uses intraday relation between spot and futures market to predict future market price. For this purpose, it uses Bitstamp log which has a US dollar price known as s_t and f_t that displays log US dollar price for CME futures. To have a better understanding, let's assume the vector for prices such as $y_t = \begin{pmatrix} s_t & f_t \end{pmatrix}'$ which analyzes the relation between the price changes that can be expressed as an error correction which is represented in equation 1:

$$\Delta y_t = \alpha (\beta' y_{t-1} + \mu) + \sum_{i=1}^p \Gamma_i \Delta y_{t-i} + \varepsilon_t \quad (1)$$

where Δy_t refers to the change in spot and futures prices at any time instance t . α measures the speed for adjustment of long and short-term deviations. β implies that $\alpha^{\text{Spot}} \leq 0$ and $\alpha^{\text{Futures}} \geq 0$.

Details of Methodology

In order to evaluate, results from equation 1 Component Share (CS) and Information Share (IS) is calculated by [Entrop et al. \(2020\)](#) that shows when value is greater than 0.5, future market leads the price information process meanwhile value less than 0.5 suggest spot market for price information process. This shows that CS is unstable in contrast to IS and results in a huge difference among percentiles.

Moreover, [Entrop et al. \(2020\)](#) examine different variables to understand the impact of the market on bitcoin price discovery. The following equation contains three sets of variables *MarketQuality*, *Uncertainty*, and *Controls* that estimate the transformation of the future market such as $(\logit - CS)_t = \beta_0 + \delta' \text{MarketQuality}_t + \gamma' \text{Uncertainty}_t + \lambda' \text{Controls}_t + \varepsilon_t$.

Results and Discussion

According to findings it is evident that all three variables have a different impact on price discovery. *Marketquality* on Component Share price discovery continuously changes concerning time that indicates there is no association among them. The *Uncertainty* variable produces a negative coefficient for the vector error correction model illustrating significance in the future market. It shows that high change in the bitcoin price market increases price discovery on the bitcoin futures market. However, *Control* variable remain insignificant in the model illustrating no impact of control price on price discovery.

Hence, different results suggest that medium-size trading is more efficient than small and large trades. Whenever medium-size trade takes place in the market then price discovery is high or on average concerning the market values.

Conclusion

This leads to the conclusion that the price discovery market changes over time. The above findings show that price discovery varies from spot market to future market based on intraday trading volume. However, medium-sized trading is more reliable that affects price discovery when splitting large trades into medium-size trades.

References

Entrop, O., Frijns, B., and Seruset, M. (2020). [The determinants of price discovery on bitcoin markets](#). *Journal of Futures Markets*, 40(5):816–837.