



DETERMINING THE FACTORS AFFECTING INVESTORS' DECISION MAKING PROCESS IN CRYPTOCURRENCY INVESTMENTS

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ABSTRACT

Purpose- The purpose of this study is to determine the factors influencing investors' decision making on cryptocurrency investments and create investors' preference partworths by conducting conjoint analysis. In conjoint method, assessment criteria are called as attributes and each attribute has more than one level.

Methodology- In this study, conjoint analysis has been conducted to create investors' preference partworths. Conjoint method is a statistical method which is conducting a survey-based research design that provides information on respondents' choices on attributes and their levels for a specific product or an investment option. In the first step, attributes and their levels have been determined, then conjoint bundles, which form the basis of the survey form, were created. As a third step, data collected have been analyzed and preference partworths have been created.

Findings- Data collected for the study have been analyzed by using Marketing Engineering for Excel software. The findings of this preliminary study indicate investors' priorities in cryptocurrency investments. By assessing these priorities, a highly competing cryptocurrency can be created.

Conclusion- The conjoint analysis gives a clear view on what investors expect from cryptocurrencies and what are their priorities. The results show the attributes and their preferred levels to improve current cryptocurrency types and to develop new ones.

Keywords: Cryptocurrency, investment, conjoint analysis, bitcoin

JEL Codes: G11, G23, G19

1. INTRODUCTION

In this study, conjoint analysis has been conducted to create participant preference partworths to be able to analyze investors' decisions on cryptocurrencies. As it is possible to notice from the previous studies in the literature, there are some factors affecting decision making process of investors. In conjoint analysis these factors are called attributes. Normally, in each investment decision, there are several attributes and each of these attributes have several levels. Decision makers or investors are dealing with a highly complex problem to sort all these attributes and their levels according to their preferences. Conjoint analysis provides a simple way to solve these types of problems. In conjoint analysis, first investment product's attributes should be determined. Then for each of these attributes their possible levels should be listed.

To be able to assess all attributes and levels, the number of attributes and the number of their levels usually result in many numbers of options. For example, if there are 6 attributes and each attribute has 6 levels, it means that investors should deal with 720 different bundles and this is not realistic. By using orthogonal design, conjoint analysis chooses a sample of bundles to represent the whole. Participants or investors investigate and sort these bundles according to their preferences.

Cryptocurrencies are newly developed financial assets, they are all digital and use cryptography. These cryptocurrencies represent real monetary value in the market. First cryptocurrency ever created was Bitcoin and it was developed by a anonymous person using an alias as Satoshi Nakamoto in 2009. He announced Bitcoin firstly in a cryptography forum. Following the first cryptocurrency, more than 1.500 alternatives have been created and these alternatives are called as altcoins.

Mainstream altcoins traded in the market are Ethereum, Ripple, Litecoin etc. However, it is doesn't have a significant financial magnitude and can be accepted as a niche market now, in the long run cryptocurrency market can be considered to be a substitute for national currencies.

In this study it is examined cryptocurrencies to determine the importance level of their attributes and levels which has an effect on investor decision making process. Five most important attributes chosen by the researchers are profitability, convenience, anonymity, security and bookkeeping. For each of these attributes, five levels have been determined. By using conjoint analysis, these attributes and their levels have been analyzed.

2. LITERATURE REVIEW

Cryptocurrencies are digital currencies which have been created digitally and cryptographed by using strong cryptography techniques. Cryptocurrencies can be used as an exchange medium in financial transactions and these transactions are under control of cryptocurrency's own network (Chohan, 2017). Bitcoin and other types of cryptocurrencies use network protocols called blockchain. Blockchain can be defined as a mechanism for a distributed network of computational nodes to periodically agree on a set of new transactions (Swan, 2015; Yli-Huumo, Ko, Choi, Park, & Smolander, 2016).

Coins nature is highly complex and contains many different features to discover. And these complex structure have not been fully researched yet (Phillip, Chan, & Peiris, 2018). The birth did not only lead to a new digitalization movement in the payments sector, but also it launched a new type of innovative technology based on decentralized digital currencies (Glaser & Bezenberger, 2015). The nature of blockchain technology allows decentralized networks. These decentralized networks are owned by no one.

Bitcoin is the market leader since 2009 in cryptocurrency market with its 52% and decreasing market share. It is a purely peer-to-peer version of electronic cash which would allow online payments to be sent directly from one party to another without going through a financial institution (Nakamoto, 2008). It is considered as the first cryptocurrency which uses the blockchain technology. After bitcoin, more than 1,500 altcoins and crypto-tokens were created. Some of them survived to date. Each day, new cryptocurrencies have been created and only few of them stay alive.

The cryptocurrency market showed a steady growth and was over \$100 billion market capitalization by June 2017 and the market size is growing day by day. This marks an increasing importance of cryptocurrencies to the financial markets. Bitcoin and altcoins compete to increase their market share. Between March 2013 and December 2014, the market value of Bitcoin increased four times and altcoins twelve times. Meanwhile, Bitcoin's market share reduced from 95% to 84% (White, 2015). Current market share of Bitcoin is about 47.6 % and descending. This means that the total market share of altcoins is more than 50 % in 2018. Since the market of altcoins is increasing rapidly, it is possible to say that in the near future Bitcoin will not dominate the whole cryptocurrency market.

Some mainstream altcoins which have large market shares are listed below:

- Ethereum
- Ripple
- Bitcoin Cash
- Stellar
- EOS
- Litecoin

Despite their increased popularity, many features and theoretical foundations of cryptocurrencies are not comprehensively understood by the investors (Chohan, 2017) even there are academic studies on cryptocurrency investments (D'Alfonso, Langer, & Vandelis, 2016; Jiang & Liang, 2018; Lee et al., 2015). Therefore, many investors shy away even though there is an appetite for cryptocurrency investment. Investments in this area are expected to grow as common knowledge increases in such coins. People's interest in them increases day by day. Many people want to become a cryptocurrency investor. These investors can be categorized into two main categories: miners and traders.

- Miners: To obtain steady payouts, users pool their computation resources to conduct pool mining (Wang & Liu, 2015). These people who run algorithms using computers and sometimes use specialized devices to find a coin are called miners.
- Traders: The people who buy and sell cryptocurrencies.

3. RESEARCH METHODOLOGY AND FINDINGS

In this preliminary study, conjoint analysis method have been used to prepare conjoint bundles and analyze the data collected with those cards. Conjoint method is a statistical analysis method and by using this method researchers determine the value of the attributes of a product or a feature for its consumers. Conjoint analysis is a method for analyzing preferences of customers; it is a useful tool for predicting and determining responses of customers to new product features and totally new products. Conjoint analysis has several types, choice based conjoint analysis is one of them and it is the preferred method for most of the researchers. CBS approach presents attribute combinations to participants simultaneously and want from them to identify which they choose.

To choose respondents, judgment sampling method has been used. The key assumption underlying this type of sampling is that, with sound judgment or expertise and an appropriate strategy, one can carefully and consciously choose the elements so as to develop suitable samples. (Smith & Albaum, 2005) In this study, the people who are already familiar with cryptocurrencies have been chosen carefully to be able to reach a convenient sampling.

In conjoint analysis, main principles are (1) segmenting an asset into its attributes and (2) choosing preference levels for each of these attributes of the chosen asset. In this study five attribute have been determined by investigating the nature of cryptocurrencies and analyzing the limited literature on them. These attributes are (1) Profitability, (2) Convenience, (3) Anonymity, (4) Security and (5) Bookkeeping. After determining these five attributes, possible levels of each attributes have been determined again by analyzing their nature and the literature. These preference levels can be seen in Table 1:

Table 1: Attributes and Levels

Attributes	Levels				
Profitability	Very high	High	Moderate	Low	Break-even
Convenience	Very easy	Easy	Moderate	Difficult	Very difficult
Anonymity	Anonymity	Pseudonymity with difficulty	Pseudonymity	Linkability with difficulty	Linkability
Security	Impossible	High	Moderate	Low	Easy
Bookkeeping	All clear	Manageable	Some confusion	Inadequate standards	Inapplicable

After determining attributes and preference levels, by using Marketing Engineering for Excel Software Conjoint Tool, 25 conjoint bundles have been created by using orthogonal design to represent all combinations. Five sample bundles can be seen in Table 2:

Table 2: Sample Bundles Created by Orthogonal Design

Attributes / Bundles	Bundle 1	Bundle 2	Bundle 3	Bundle 8	Bundle 9
Profitability	Very High	Very High	Very High	High	High
Convenience	Very Easy	Easy	Moderate	Moderate	Difficult
Anonymity	Anonymity	Pseudonymity with difficulty	Pseudonymity	Linkability with difficulty	Linkability
Security	Impossible	Moderate	Easy	Impossible	Moderate
Bookkeeping	All Clear	Inadequate standards	Manageable	Some Confusion	All Clear

After preparing 25 bundles, a questionnaire form has been designed to collect data. The form consists of five demographic questions and 25 bundle options. Respondents were asked to answer demographic questions collected for further studies and rank bundles from the most preferable (1) to least (25).

Collected conjoint bundle preference data have been transformed to preference grades (100=most preferable, 1=least preferable) and analyzed by using Marketing Engineering for Excel software.

In conjoint analysis, as a first step respondents' preference partworths have been created. Partworths are estimates from conjoint analysis of the overall preference or utility associated with each level of each factor used to define the product or service. In partworths table, as a convention, the least preferred level of each attribute gets set to 0 for all respondents and the sum of the most preferred levels of all attributes is equal to 100. The importance of an attribute equals the value of the most preferred level for that attribute (Marketing for Engineering Conjoint Tutorial).

4. CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

Academic researchers and industrial practitioners widely supported almost for 50 years, and this shows the potential of the conjoint method in providing a useful way to represent consumer preferences and the ability to predict the behavior of the consumer towards new stimuli (Green & Srinivasan, 1978). In the literature many studies have examined factors affecting investor decisions with a consumer behavior perspective. In this study, we proposed an attribute and preference level-based approach to investigate investors' decision-making process on cryptocurrencies.

With conjoint method, various types of analysis can be conducted, respondents' preference partworths analysis is one of them. Others can be listed as utilities, counts, importance levels, market shares, and customers' purchase likelihood simulations.

Today, the importance of crypto currencies is increasing day by day and new currencies take their place in the market. Bitcoin, a long-standing crypto currency player, faces competitors who are more powerful than bitcoin. In this study, the attributes of the new currencies have been prioritized in order to obtain a competitive advantage in the crypto-currency market.

Investor behavior varies according to the characteristics of investment instruments. In this study, investor behavior in purchasing cryptocurrencies is set forth using conjoint analysis technique. Five attributes with five levels each are chosen. It is predicted that these attributes are the most important indicators of investor behavior. The importance of this study is probably the first study using conjoint analysis to determine the most important factors and their levels influencing cryptocurrency investment decisions. For further researches, investors' preferences for can be determined and market share analysis for hypothetical bundles can be analyzed.

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