Relation Analysis of Investment Behavior and Risk Expectation of Cryptocurrencies

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***Abstract*—The technological development of the blockchain technology allows a new way of processing secured transactions and payments between different parties. Therefore, it is not surprising that new virtual currencies are developed to open new payment methods, as well as investment opportunities. To estimate the intention to buy and use cryptocurrencies, an empirical analysis was performed. The question of research is whether an investment in cryptocurrencies is primarily made for speculative reasons or because of a belief in the establishment of a digital currency. Although eight different cryptocurrencies are investigated, most respondents refer to Bitcoin as the one over all cryptocurrencies. The ordinary regression analyses on base of survey data, which was distributed online, outlines that the intention to use cryptocurrencies is mainly driven by investment purposes.**

Keywords-investments; cryptocurrencies; risk; experience; performance expectancy; mean analysis; UTAUT2.

I. INTRODUCTION

The following article is an expanded work presented on the CENTRIC conference [1].

Cryptocurrencies have achieved market capitalization of currently around 250 billion euros due to the strong growth in recent years [2]. On the one hand, investors see cryptocurrencies as an opportunity to reach high revenues accompanied with a specific (potentially high) risk, while on the other hand, researchers and experts see cryptocurrencies as opportunity to create a new known and general accepted currency and payment method [3][4]. Therefore, it will be analyzed what most private customers/users think about cryptocurrencies (e.g., Bitcoin or Ethereum) and how cryptocurrencies are used. To estimate the described customer behavior, quantitative research using an online survey is applied. The resulting database will be analyzed using statistical techniques for data estimation and the statistical program Statistical Package for the Social Sciences (SPSS), which targets on the estimation of results about the later described hypotheses.

In this respect, the paper is structured as follows. In Section II, (a) cryptocurrencies, (b) blockchain, (c) digital versus traditional currencies, as well as (d) challenges will be described. Section III will include the used research model. Following this section, the methodology and the theoretical approach for carrying out the analysis, will be explained. In Section V, the results of the empirical analysis are presented. The paper concludes with a summary of the results in Section VI.

II. TECHNICAL BACKGROUND

The following background section covers the definition of the research objectives cryptocurrencies and blockchain as well as the used research and conceptual model as well as the challenges in the named research field.

A. Cryptocurrencies

Although the first ideas to develop a digital and anonymous currency date back to 1989 [5], the first virtual cryptocurrency was implemented in 2008 [6], when Nakamoto published an approach for an electronic payment system and a new currency "Bitcoin" based on blockchain technology [7]. This approach differed from earlier approaches in particular in that all transfers must be validated by the community. This validation was performed decentral using a synchronized blockchain across multiple users [8]. To this extent, no third party is required as an intermediary to carry out secured transaction. This means that the currency Bitcoin was created primarily with the intention that transmissions can be cryptographically secured and tracked [6][9]. In addition, cryptocurrencies based on blockchain technology are implemented to (a) guarantee fast worldwide money transfers, (b) establish the privacy of the participating parties through anonymity, and (c) advance the development of a payment system independent of the traditional banking system [4].

B. Blockchain

Following Nakamoto [6], a blockchain is a continuously expandable list of data records, called "blocks", which are linked together by cryptographic methods. Each block typically contains a cryptographically secure hash of the previous block, a timestamp and transaction data [10]-[12]. The blockchain allows the linking of transfers within a decentralized platform, which is distributed and publicly assessable [13][14], where through recording of transfers, processes and information are secured by cryptographic techniques [11][15][16]. The fact that a large number of users of the blockchain can access and track the linked blocks within the blockchain creates confidence in the reliability of the digitally applied processes and transfers

[8][11][12][14][16]. Finally, blockchain provides a solution for a trusted, secure, decentralized and (by consensus) peer-validated approach [17]. In general, the entire database is embedded in a peer-to-peer network architecture with equal nodes. Due to the node principle, the system is not dependent on a central location, which could be a single point of failure [4].

Since, the information and data are implemented in the blockchain, which is decentralized distributed, no information can get lost [14]. Any implemented block is irreversibly linked to a previously block and cannot be deleted. Each block contains information about transactions and information of the previous block [6]. A new block is only added in case the verification through the validation and consensus process by the community is done [18]. Any update needs to be performed in a new developed block, which needs to be verified by the described process [19].

The application of blockchains guarantees a technically secure communication on the base of mutual authentication, as well as tamper-resistant asymmetric cryptography, which enables an information exchange by timestamped and logged records [8][13][20][21][22][23]. The blockchain approach implies the irrevocability of changes, i.e., the blocks or information remain permanently in the system and cannot simply be deleted [8][19]. The security mechanisms are implemented to avoid any spam and denial-of-service attacks [24].

The interaction of users within the blockchain takes place by using a related key pair, which comprises a private key and a public key [25]. The latter is publicly visible and comparable to an address that each node has; it can be regenerated for each transaction in order to maintain anonymity. If a node wants to create a transaction and, e.g., add new data, this can be done anytime autonomous by signing it with its (secret) private key [26]. It is then sent to all nodes of the peer-to-peer network to reduce single point of failures [16]. Each node is then able to use the public key to verify the node that created the transaction before a distributed consensus mechanism regulates the addition of the new block [27][28]. A consensus mechanism implemented through the Distributed Ledger Technology ensures that there is only one next block, which is necessary to obtain integrity of the blockchain [16][27][29]. This means that the consensus mechanism ensures that the transactions and blocks are sorted chronologically, which verifies the integrity, coherence and consistency of the blocks sustaining in the blockchain [8][16][20].

A subsequent update process ensures that all participants always have the latest version of the database at their disposal [30]. There are several methods for validating the transaction and reach consensus. The most common of which are currently known as 'Proof of Work' and 'Proof of Stake'. In these two methods, hash values are generated by the network nodes according to a certain pattern. Depending on the length of the blockchain, the degree of difficulty and the computing power required for this increase. In this context, the working nodes are also referred to as 'miners' [28]. The type of the utilized consensus mechanism varies in dependency from the type of network and other factors [26]. In summary, when a transaction is validated, it is stored in the block and chained in the blockchain [16], with the community deciding on the validation. I.e., this validation could only be manipulated by someone who has control over the majority (> 50%) of nodes, which is extremely unlikely due to the worldwide decentralized networks [8]. The timestamp documents (transparently for the whole network) the time of implementation and adjustments [31].

C. Digital versus Traditional Currencies

The main differences between traditional and digital currencies are: (a) The digital currencies are organized decentral using block-chain technology and do not require banks or other intermediaries (unlike traditional currencies). (b) The digital currencies are (uniformly) valid and available worldwide [32], while the traditional currencies are generally specific to individual states or economic areas [33]. The use of traditional currencies (especially for international transactions) results in relatively high transaction costs, whereas digital currencies cause no or only very low transaction costs due to the consensus mechanism and the very fast "automatic" validation of transactions [4][32][34]. (c) Digital currencies offer a high degree of anonymity and protection of personal data, which is not provided by traditional currencies (e.g., credit card payments or money transfers). In traditional currencies, this anonymity could only be achieved through cash payments, but the transaction costs are extremely high. In addition, cash payments are strongly limited or regulated in many countries.

Another central feature of a currency is that it is always available, transportable, and divisible. This is also true for cryptocurrencies [35].

In contrast to the traditional currencies, each cryptocurrency has a fixed limit regarding the maximum currency units that can be issued [35].

D. Challenges

Due to this "gap" regarding the legal and regulatory framework, there are potential uncertainties regarding the clarification of possible conflicts between trading partners [11][36].

In particular, the 'Proof of Work' mechanism causes extremely high-energy consumption, which is a factor of several thousand higher than traditional financial transactions [37].

For a long-term success, a digital currency (using blockchain technology) must achieve the acceptance of the majority of the population. After all, the long-term importance of the digital currency ultimately depends on the number of actual users and the acceptance as a payment system by the trade [38].

III. Research Model – Adjusted Model with Elements of the Unified Theory of Acceptance and Use of Technology 2

In this section, the used research model will be described. The focus in this research paper will be on the relationships between (a) the risks of cryptocurrencies and the intention to use cryptocurrencies, (b) the experiences with cryptocurrencies and the intention to use cryptocurrencies, and (c) the general experiences with investments and the intention to use cryptocurrencies. The analysis of the named research concepts follows the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), which developed by Venkatesh, Thong, and Xin [39]. The UTAUT2 expands the existing UTAUT by the additional elements of hedonic motivation, price, and habit/experience, which allows a broader consideration of critical influence factors on the user behavior and the behavioral intention to use [39]-[41].

For this reason, to estimate these and further relations, an adjusted approach of the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) will be used, which is displayed in the conceptual model in Figure 1.

In principle, it can be assumed that higher returns or expected returns are generally associated with a higher investment risk. In this respect, it is necessary to examine how much risk they are prepared to take in order to achieve high returns. It can be assumed that investors who have more experience with investments and who have often made these via digital channels (e.g., online banking) are generally more open to the use of cryptocurrencies.

Finally, it should be noted that so far there has been no scientific review of the relationship between (a) performance expectations, (b) experience, (c) perceived risk and behavioral intention to use cryptocurrencies. The variable of perceived risk is treated as external variable in the further analysis. Additionally, the strength of perceived risk and experience will be estimated by linking these variables with the performance expectancy. The performance of the investments in digital currencies is rated by the performance expectancy.

Problematically, (a) the expected performance, (b) experience, and (c) perceptions of risks differ between the individual customers [42]. This means, the user attitudes and beliefs are completely subjective [42]. The experience comes from the fact that users become more and more familiar with a technology or service after it has been used for the first time. [40][43][44]. With the increasing use of a technology or a service, the user gains more and more experience and knowledge and learns with it, whereby the use becomes more and more self-evident and "automatic" [45].

Since habits and experiences allow predictions to be made for later use, it can be predicted that experience positively influences the utilization of cryptocurrencies.

In principle, the existing risks influenced the uses and investment behavior of customers [46]. This is particularly reflected in the fact that the risk has a significant influence on customer acceptance of innovations (e.g., mobile payment, mobile banking, and mobile shopping) [47]-[52].

Previous research identified that the perceived risk is one of the key drivers for the estimation of uncertainties in mobile payments, mobile shopping, mobile banking, and mobile transactions [47][49]-[53], because customers fear a lack of control.

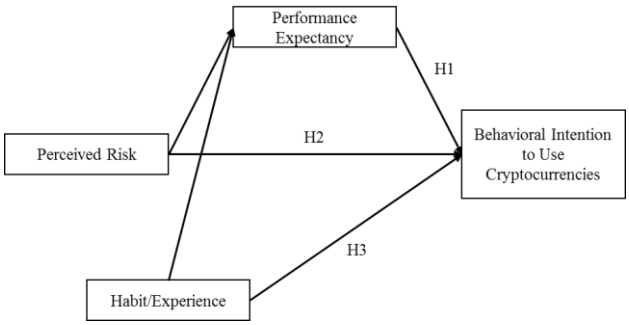

Figure 1. Conceptual Model

Consequently, the literature conveys the feedback that in several cases risks and uncertainties influence the customer user behavior.

Based on the explanations, the hypotheses for this research paper are:

H1: The customer perception of performance expectancy of investments (including digital currencies) has a directly positive effect on the intention to use cryptocurrencies.

H2: Customers' experience with investments (including digital currencies) has a direct positive impact on their intention to use cryptocurrencies.

H3: If customers are generally affine to risk when making investments, this has a direct positive effect on the intention to use cryptocurrencies.

IV. Methodology

In this section, the approach for the verification of the hypotheses will be shortly introduced. Therefore, to test the hypotheses, an online survey was carried out to obtain information on the investment behavior of private individuals. In particular, the survey covered the perception of users regarding cryptocurrencies and the resulting investment behavior. The focus here is on the perceived performance of digital currencies and investments made.

To achieve the needed user information, a cross-sectional online survey ("one-shot survey") had been prepared and distributed through multipliers in social media platforms [54].

As this is an online survey, it cannot be guaranteed (as opposed to a personal survey) that most respondents will fully answer the questions. In addition, the questionnaire was designed in such a way that individual questions could not be skipped without ending the survey. In this respect, a relatively large number of participants prematurely terminated their

responses to the questionnaire. The survey was distributed during the period from May to June 2018. In this period, 155 people have opened and started the questionnaire. However, only 62% (96 out of 155) respondents have finished the questionnaire. For this reason, the sample of the whole analysis will be the data set covering the 96 respondents, which have fully completed the questionnaire.

In the first part, the demographic information (such as age, gender and educational level) of the respondents was collected. In the following part the previous investment behavior and the knowledge of the participants about cryptocurrencies was determined. It should be determined whether the respondents know cryptocurrencies and whether they have already made investments based on cryptocurrencies. A positive answer (= experience with cryptocurrencies) was used to determine in more detail how many transactions, how much with which cryptocurrency the participants have already carried out. Since the third part is in higher importance for the later data analysis, all the implemented questions were coded in the 5-Point-Likert-scale format [55]. The third part covers especially questions regarding the respondent investment intentions in cryptocurrencies. In addition, the risk appetite and expected return (5-Point-Likert-scale: high to low) are important information in this part. The subsequent fourth part of the questionnaire considers questions regarding the user perception about the course of the cryptocurrency investment. As in the part before, the questions are coded in 5-Point-Likert-scale format (very likely to very unlikely). In the last part of the questionnaires, the respondents were queried about the future of cryptocurrencies in general.

The collected data were analyzed using quantitative research methods and the SPSS statistical program. To examine the reliability and validity of the data, the estimation of the Cronbach's Alpha and the Exploratory Factor Analysis were performed.

Only the eight largest cryptocurrencies (measured by market capitalization) were taken into account.

As mentioned above, the used approach only contains elements of the UTAUT2. Therefore, the evaluation is not done by structural equation modeling [39]. Instead, an ordinary least squares regression to test the significance of each hypothesis is used. In the final hypothesis, all the previous considered single variables, like (a) perceived performance, (b) experience, (c) risk appetite, (d) investment and speculation type, (e) regulations, and (f) assessment of the acceptance as alternative payment method will be related to the undertaking of investments in cryptocurrencies.

V. Data Analysis and Results

Following the described approach in conducting the survey, the outcomes for the estimation of the hypotheses will be deeply illustrated.

A. The Difference of Cryptocurrency Applications

Before going in-depth to the analysis of the questionnaire, one aspect is necessary to remind. Although most of the cryptocurrencies base on the blockchain and the wallets of the customers are numeric codes in general, cryptocurrencies are introduced for different purposes. Therefore, e.g., Bitcoin is implemented for solving financial transactions, whereas e.g., Ethereum is commonly used for establishing smart contracts. From this point of view, it would be preferable in differentiating the outcomes in relation to their purpose.

Despite the descriptive results as well as mean considerations will indicate some outcomes differentiated on the respective cryptocurrencies. Most respondents refer to Bitcoin as the one over all cryptocurrencies. In this regard, the outcome is possibly kind of biased. Although further investigations would be preferable, the low number of respondents investing in other cryptocurrencies than Bitcoin and Ethereum does not allow a representative result. Therefore, a greater statistical differentiation cannot be pursued.

B. Descriptive Results

In the following, the descriptive results of the performed survey will be introduced. 53.1% of the respondents are male and the average age of a respondent is between 25 and 29 years.

With 41.7% respectively 24.0%, the group of the 18 to 24 years respectively 25 to 29-year-old persons have the largest proportions of respondents within the survey (see Figure 2). On the base that the age group of the 20- to 29-year-old persons has only a 12.2% share of the total population in Germany, it must be noted that the young persons below the age of 30 years old are overrepresented in the survey by a factor of approx. five [56]. Since cryptocurrencies are virtual goods, their use requires a high Internet affinity. Based on a study of ARD/ZDF from 2015 the age group of the 20 to 29-year-old persons does nearly complete use the internet [57].

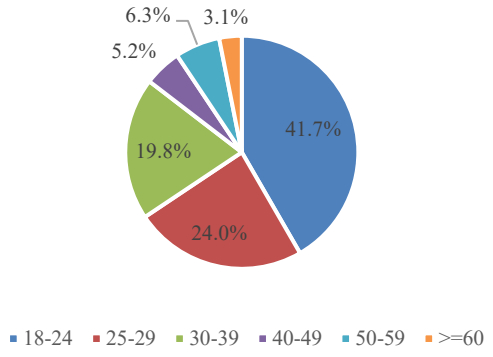

Figure 2. Age Distribution

Since younger people generally use the Internet more often and have a greater interest in virtual goods than older people

have, the previously established overrepresentation of younger age groups is not surprising. With regard to the age, the survey is not representative for the total population of Germany.

Considering the educational background in Figure 3, nearly the half of the respondents (46.9%) state that the school leaving examination is the education degree what they have. A quarter of the respondents have completed the Master degree (25%) from university.

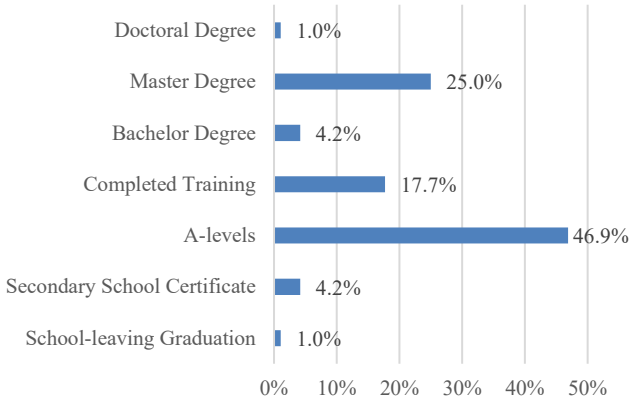

Figure 3. Distribution of Graduation

The average net household income of the respondents is between 1,000 and 1,999 euros per month, with most of the participants (36.3%) having a net (household) income of less than 500 euros per month. In addition, almost three quarters (73.8%) have a net (household) income of less than 2,000 euros. In connection with the level of education and age, it can be assumed that the interviewees are predominantly students.

90.6% (= 87/96) of the respondents know what cryptocurrencies are. These 87 persons are the basic population (= 100%) for questions about cryptocurrencies.

47.9% (= 46/96) of the respondents have already made financial investments. However, only 35.4% (34 of 96 respondents) have already done investments in or with cryptocurrencies. From this point of view, the 34 respondents will be the basic population (= 100%) for all questions regarding the investment behavior with cryptocurrencies, especially number of transactions, amount of invested financial resources and perceptions regarding the development of the invested portfolio.

Firstly, the descriptive results for the respondents, who know cryptocurrencies (=87), will be illustrated. In general, all the respondents know Bitcoin as cryptocurrency, whereas two thirds of the respondents answer to know BitcoinCash and Ethereum, which can be seen in Table I.

Although 36.9% of the respondents are very risk-affine with regard to investments, only 23.4% of the respondents describe themselves as speculators. Contrary, 39.3% of the respondents answer to have a risk-shy nature, which can be also seen in estimation that 37.8% of the respondents estimate to be arbitragers. By regarding the estimation of returns, only 21.7% of the respondents think to get low returns. Although it is well known that higher returns can only be achieved with higher risks, some of the respondents who are risk-averse hope for medium to high returns.

TABLE I. DEGREE OF AWARENESS OF CRYPTOCURRENCIES

Cryptocurrency	Degree of Awareness
Bitcoin	**100.0%**
Bitcoin Cash	**67.1%**
Ethereum	**66.7%**
Litecoin	**61.4%**
Ripple	**58.5%**
EOS	**45.8%**
Neo	**41.0%**
Cardano	**35.4%**

Interestingly, 87.8% of respondents think that the new cryptocurrencies have been brought to life to drive a new form of speculation and investment. This is underlined by the fact that only 22.9% of respondents see Bitcoin as an alternative payment method to credit cards and the like. 43.4% of respondents involved in investment argue for regulatory intervention or restrictions in the cryptocurrency market, while 32.5% reject it.

Now, the results of the respondents using cryptocurrencies are shown. As already mentioned, however, the sample size is very small with 34 respondents, which is why the results cannot be generalized.

Figure 4 shows the distribution of the investment in the eight most important cryptocurrencies. 83.0% of respondents have already invested in Bitcoin. In addition to Bitcoin, the currency Ethereum seems to be of particular interest to investors.

48.5% of the respondents have invested at least 2,000 Euro in cryptocurrencies. 67.6% of these investors state that they make a profit by investing in cryptocurrencies. However, 51.4% of the investors have only short-time experience with cryptocurrencies since they invest in them for the last 2 years. Cryptocurrencies have become much more popular, especially in recent years. It is therefore not surprising that many investors have only recently started to invest in and trade with cryptocurrencies. Due to this short experience time horizon, most investors have an extremely limited ability to assess the long-term performance of cryptocurrencies and the risk of an investment. In this respect, one would normally expect investors to be generally extremely cautious and careful in assessing the development and returns of cryptocurrency investments.

However, the results of the questionnaire, illustrated in Figure 5, show that investors have a vastly different assessment of the performance of their currency investments for each cryptocurrency.

Most of the investors (82%) assumes that a total loss of the investment does not occur. Contrary, over the half of the investors assumes to gain profits (in 6 months: 55%; in 12

months: 71%). Considering, the probability to get a loss in the investments, 58% of the investors estimate this as unlikely within the next 12 months.

Interestingly, in case investors decide to invest in cryptocurrencies, they take a couple of cryptocurrencies. No one of the investors takes only one cryptocurrency. 54.5% of the investors invest in more than 5 different cryptocurrencies. Diversification of financial resources across different investments indicates hedging, if one cryptocurrency fails, other cryptocurrencies can compensate for the loss. Such investor behavior is typical for brokers who trade in different financial securities to make profits. It can therefore be assumed that cryptocurrencies are bought more as a tool to make (speculative) profits than as an alternative means of payment or as a tool to improve trading or production processes.

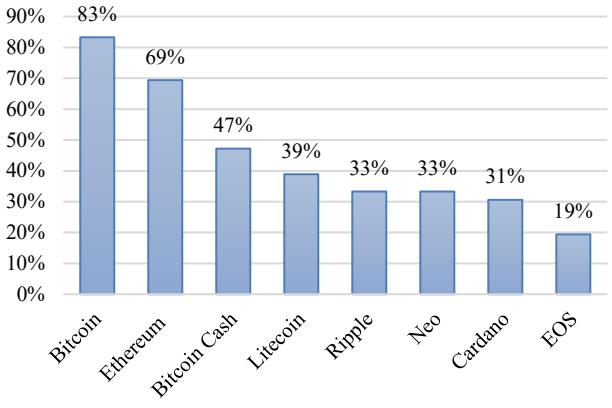

Figure 4. Investments in Cryptocurrencies

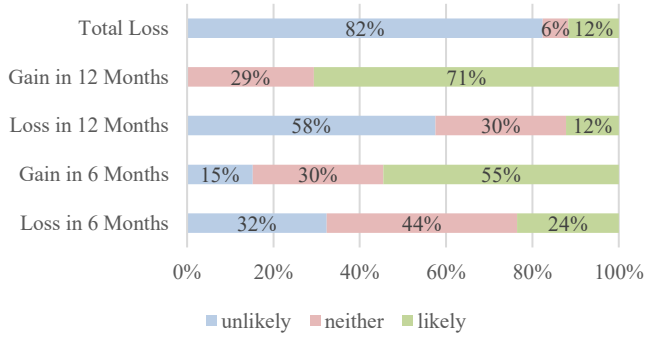

Figure 5. Expectations regard to the Cryptocurrency Investment

Figure 6 shows the objectives of the investments. In general, most investors in cryptocurrencies believe in long-term increases in value. In comparison to the overall group of respondents knowing and using cryptocurrencies, the users of cryptocurrencies believe in a higher degree that Bitcoin could develop to an alternative currency and payment method.

In general, over 50% of the investors have a long-term direction by investing in cryptocurrencies. In this respect, the investment in these currencies usually takes place with a longer time horizon (of several years).

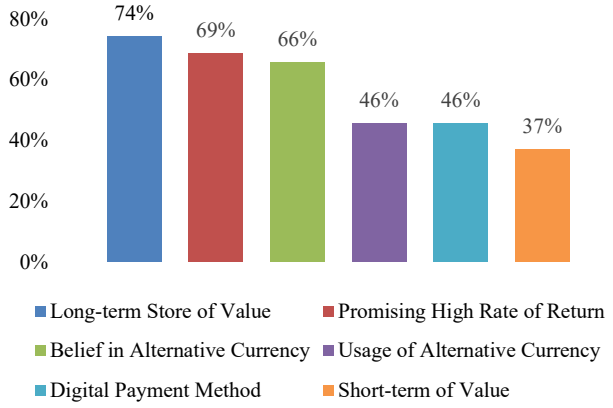

Figure 6. Purpose in Cryptocurrencies

Overall, the investment atmosphere regarding cryptocurrencies is quite positively. Investors perceive high profits by doing the investments and see only minor risks of a loss of their investments.

C. *Reliability and Validity*

The results of the reliability and validity analyses are illustrated in Tables II and III. In general, this study includes the following 7 concepts: (1) performance expectancy, (2) experience, (3) perceived risk, (4) intention to use cryptocurrencies, (5) purposes of investments in cryptocurrencies, (6) usage of cryptocurrencies, and (7) prominence of cryptocurrencies.

TABLE II. RELIABILITY ANALYSIS

Research Concepts	Cronbach's Alpha
Performance Expectancy	**0.335**
Experience	**0.282**
Perceived Risk	**0.779**
Intention to Use Cryptocurrencies	**0.624**
Purposes of Investments in Cryptocurrencies	**0.777**
Usage of Cryptocurrencies	**0.726**
Prominence of Cryptocurrencies	**0.947**

Generally, all named concepts are examined in the terms of reliability and validity. Following Cronbach, Alpha values must be higher than 0.7/0.6 to for a good/sufficient reliability [58]-[60]. Based on the results in Table II, the collected data for 5 of the 7 named aspects are at least sufficiently reliable. Solely, the concepts of performance expectancy and experience seem to be completely not reliable.

After the testing of the reliability, the exploratory factor analysis includes the assessment of Kaiser-Meyer-Olkin criterion (KMO), the significance test from Bartlett, and the examination of the cumulative variance to evaluate the

validity of the collected data [61]-[65]. Validity considers the consistency of an empirical measurement with the based conceptual/logical measurement concept. To reach a good validity, the concepts should reach significant p values ($p<0.05$) in the Bartlett-Test and KMO values above 0.7 (at least higher than 0.5) [61]-[65].

Table III shows a sufficient validity for 6 of the 7 concepts. The validity scores are also supported by the results of the cumulative variances higher than 50% except the concept of experience.

TABLE III. VALIDITY ANALYSIS

Research Concepts	KMO	Bartlett-Test	Cumulative Variance
Performance Expectancy	**0.284**	p < 0.000	**78.844%**
Experience	**0.562**	p < 0.000	**47.657%**
Perceived Risk	**0.637**	p < 0.000	**71.614%**
Intention to Use Cryptocurrencies	**0.640**	p < 0.000	**64.520%**
Purposes of Investments in Cryptocurrencies	**0.686**	p < 0.000	**74.544%**
Usage of Cryptocurrencies	**0.642**	p < 0.000	**69.377%**
Prominence of Cryptocurrencies	**0.911**	p < 0.000	**74.529%**

Despite the mark of 50% is not completely achieved, the explanatory rates of the variances can be rated as sufficiently high [62]-[64]. Consequently, the reliability and validity of the collected data are proved.

D. Mean Analysis

Before the relations between the different concepts will be illustrated in-depth, several mean analyses should give an insight if specific characteristics have an impact on the knowledge about cryptocurrencies as well as on the risk assessment and the development of the investment.

Here, the Analysis of Variances (ANOVA) figures out if there are differences in means between the different groups of a variable (mostly the two specifications of a binary-coded variable) are considered. A difference in means gives a direct suggestion that possibly variables have an impact in changing the variable significantly. In more simplified words, the ANOVA-test reveals in a first stage, if possible, variables relate to the investigated variable. By performing the ANOVA, the F-Test needs to be greater than 3.90 to determine a significant difference in means [64].

Table IV indicates the differences in means in gender regarding the eight mostly used cryptocurrencies. Most importantly, the prominence is coded in a 3-point-scale with one for unknown, two for heard but unknown about the use, and three for known and trusted in the use. Considering the following Tables IV, V and VI, the ANOVA-tests identify significant differences in means between the two regarded groups. Since all F-values are above 3.90, it must be concluded that female and male respondents have different knowledge on average.

TABLE IV. MEAN ANALYSIS GENDER VS INVESTMENT IN SEVERAL CRYPTOCURRENCIES

	Gender	Mean	Difference in Means	ANOVA F
Bitcoin	**Female**	**2.09**	**0.73**	**53.726****
	Male	**2.72**		
Ethereum	**Female**	**1.31**	**1.25**	**104.713****
	Male	**2.56**		
Ripple	**Female**	**1.19**	**1.16**	**82.429****
	Male	**2.35**		
BitcoinCash	**Female**	**1.46**	**0.86**	**34.171****
	Male	**2.32**		
Litecoin	**Female**	**1.31**	**1.05**	**56.690****
	Male	**2.36**		
EOS	**Female**	**1.20**	**0.65**	**22.217****
	Male	**1.85**		
Cardano	**Female**	**1.06**	**0.77**	**31.452****
	Male	**1.83**		
Neo	**Female**	**1.11**	**0.78**	**31.573****
	Male	**1.89**		

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

TABLE V. MEAN ANALYSIS GENERAL INVESTMENT BEHAVIOR VS INVESTMENT IN SEVERAL CRYPTOCURRENCIES

	General Investment Behavior	Mean	Difference in Means	ANOVA F
Bitcoin	**No**	**2.10**	**0.69**	**72.219****
	Yes	**2.79**		
Ethereum	**No**	**1.41**	**1.19**	**86.333****
	Yes	**2.60**		
Ripple	**No**	**1.27**	**1.14**	**82.889****
	Yes	**2.41**		
BitcoinCash	**No**	**1.48**	**0.92**	**44.147****
	Yes	**2.40**		
Litecoin	**No**	**1.37**	**1.06**	**59.687****
	Yes	**2.43**		
EOS	**No**	**1.12**	**0.90**	**58.496****
	Yes	**2.02**		
Cardano	**No**	**1.05**	**0.90**	**51.721****
	Yes	**1.95**		
Neo	**No**	**1.10**	**0.90**	**49.569****
	Yes	**2.00**		

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

Also, significant differences in the means can be seen in the ANOVA-tests between the group of investors, who have done general and cryptocurrency investments, and the non-

investors in the knowledge about the eight most common cryptocurrencies.

In Table IV, we see that for the eight cryptocurrencies, male respondents on average have greater knowledge regarding cryptocurrency investments. Bitcoin is the most well-known cryptocurrency, while male respondents generally have at least a general idea about the other currencies. In contrast, female respondents hardly know any cryptocurrencies other than Bitcoin. Table V shows that respondents who invest more frequently (regardless of which areas) are on average knowledgeable about the eight cryptocurrencies.

TABLE VI. MEAN ANALYSIS INVESTMENT BEHAVIOR IN CRYPTOCURRENCIES VS INVESTMENT IN SEVERAL CRYPTOCURRENCIES

	Cryptocurrency Investment Behavior	Mean	Difference in Means	ANOVA F
Bitcoin	No	2.08	0.92	362.195**
	Yes	3.00		
Ethereum	No	1.46	1.39	172.331**
	Yes	2.85		
Ripple	No	1.36	1.23	102.244**
	Yes	2.59		
BitcoinCash	No	1.49	1.15	86.842**
	Yes	2.64		
Litecoin	No	1.38	1.32	134.596**
	Yes	2.70		
EOS	No	1.18	1.00	79.654**
	Yes	2.18		
Cardano	No	1.04	1.19	141.566**
	Yes	2.23		
Neo	No	1.10	1.14	113.228**
	Yes	2.24		

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

TABLE VII. MEAN ANALYSIS GENDER VS RISK EXPECTATION

	Gender	Mean	Difference in Means	ANOVA F
Risk Appetite	Female	2.39	0.99	15.802**
	Male	3.38		
Expected Return	Female	2.97	0.55	6.431*
	Male	3.52		
Risk Type	Female	1.41	0.76	24.588**
	Male	2.17		
Bitcoin Payment Method	Female	2.26	0.47	4.051*
	Male	2.73		
Cryptoinvestment Speculation	Female	4.00	0.23	2.292
	Male	4.23		
Regulation of Cryptoinvestment	Female	3.14	0.14	0.131
	Male	3.04		

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

In particular, investors are generally familiar with Bitcoin and Ethereum. Conversely, people who do not invest regularly are, on average, unfamiliar with most of the eight cryptocurrencies surveyed. Only Bitcoin reach a greater prominence. Comparing these results with the responses of investors who regularly invest in in cryptocurrencies (see Table VI), the results are almost the same.

Based on the further tables, the mean analysis should distinguish between the risk and return expectation regarding cryptocurrencies. Besides the risk type, which is coded with 3-point-Likert-scale (1 = arbitrager to 3 = speculator), the other questions are coded in a 5-point-Likert-scale manner. For the risk and return expectation, the 1 stands for a low-level-expectation, whereas the 5 means a high-level expectation. For the other variables, the 5-point-Likert-scale is going from do not agree (1) to agree (5).

TABLE VIII. MEAN ANALYSIS GENERAL INVESTMENT BEHAVIOR VS RISK EXPECTATION

	General Investment Behavior	Mean	Difference in Means	ANOVA F
Risk Appetite	No	2.60	0.71	7.768**
	Yes	3.31		
Expected Return	No	3.02	0.53	5.946*
	Yes	3.55		
Risk Type	No	1.58	0.54	11.502**
	Yes	2.12		
Bitcoin Payment Method	No	2.39	0.28	1.379
	Yes	2.67		
Cryptoinvestment Speculation	No	3.95	0.36	6.075*
	Yes	4.31		
Regulation of Cryptoinvestment	No	3.12	0.07	0.072
	Yes	3.05		

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

Considering Table VII, the ANOVA-test identifies that regarding the risk expectations, the estimations between male and female respondents differ significantly. For the three questions to risk appetite, expected return, and risk type, the F-scores exceed the mark of 3.90.

In average, the female respondents answer that they take a lower risk if they are doing investments, especially cryptocurrency investments. In this regard, the female respondents seem to be risk-averse, whereas the male respondents seem to be risk neutral. Considering the risk taken, male respondents on average expect a medium-high return, whereas the return expectation of female respondents seems to be lower.

Despite the differences regarding the risk/return expectation, in average, independent from the gender, the respondents report that they see cryptocurrencies just for speculation perspectives. Regarding a possible regulation, the respondents do not give sophisticated feedback, independent from the gender. Accordingly, most respondents (of both genders equally) do not see Bitcoin as an alternative payment method. These results are supported by the ANOVA, as for the three questions a (weakly) significant difference in the means can only be seen for the question about Bitcoin as a means of payment. For the other two variables, the F-scores do not exceed 3.90, indicating that female and male respondents do not answer differently.

TABEL IX. BEHAVIOR IN CRYPTOCURRENCIES VS RISK EXPECTATION

	Crypto-currency Investment Behavior	Mean	Differ-ence in Means	ANOVA F
Risk Appetite	No	2.50	1.19	23.892**
	Yes	3.69		
Expected Return	No	2.90	0.98	24.098**
	Yes	3.88		
Risk Type	No	1.53	0.80	28.604**
	Yes	2.33		
Bitcoin Payment Method	No	2.32	0.53	5.046*
	Yes	2.85		
Cryptoinvestment Speculation	No	4.02	0.28	3.505
	Yes	4.30		
Regulation of Cryptoinvestment	No	3.30	0.54	3.866
	Yes	2.76		

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

In the following, Table VIII displays that the F-values are only above of the value 3.90 and significant for the relation of the general investment behavior and the risk expectations. Regarding the other parameters in Table VIII, they do not reach a F-value greater than 3.90.

Here, the outcomes of the general investment behaviors regarding the named expectations, do not change. This means, people, who invest in general, they anticipate a greater risk in doing that in comparison to people, who do not invest. However, in comparison with gender perspective, the differences between investors and non-investors are not heavily. Regarding the risk type and the risk appetite, in average both groups seem to be risk neutral.

With Table IX, the cryptocurrency investment behavior is considered regarding the difference in means of the already named expectations. Since the cryptocurrency investment field is a specific part of the general investment, it could be assumed that the general results are not mainly different. The outcomes show that the F-Scores of the risk expectations even exceed the previous consideration. As a result, the risk expectations are more resilient than in the consideration of the general investment behavior. Following this point, investors in cryptocurrencies believe in a greater risk. As the general group, the investment in cryptocurrencies does not trigger the opinion about any regulatory or governmental intervention.

However, overviewing the results of Table VII and Table IX, the outcomes for the questions regarding the usage of Bitcoin as payment method as well as the usage of cryptocurrencies for speculation purposes are differently. Table IX shows an F-value of 5.046 (and thus greater than 3.90) for the use of Bitcoin as a means of payment. Compared to the overall group of all investors, the cryptocurrency investor group is more open to using Bitcoin as an investment option on a larger scale. Cryptocurrency investors have a neutral position regarding the use of Bitcoin as a means of payment, while non-cryptocurrency investors (who are invested in other asset classes) tend to reject the use of Bitcoin as a means of payment on average. However, the group of cryptocurrency investors does not exclusively believe that crypto investments are made only for speculative purposes. In contrast, people who do not invest in cryptocurrencies (but invest in other asset classes) believe that cryptocurrencies are only made for speculative purposes.

Above of Table IX, Tables X and XI go in-depth of the cryptocurrencies Bitcoin and Ethereum in relation to the risk expectations. The outcomes of the performed ANOVA-tests indicate differences in means whether the respondents invest in Bitcoin or Ethereum.

Though, in comparison to the previous explanations, the ANOVA-tests identify that a difference in means between investors and non-investors of Bitcoin and Ethereum have not different expectations regarding risk and return of cryptocurrencies. All the F-tests are insignificantly, which identifies that averagely both considered groups decide similar in the questions. Since averagely there are no differences in the expectations, the in-depth consideration of Bitcoin and Ethereum does not add a new information.

TABLE X. MEAN ANALYSIS INVESTMENT BEHAVIOR IN BITCOIN VS RISK EXPECTATION

	Investment in Bitcoin	Mean	Difference in Means	ANOVA F
Risk Appetite	No	4.17	0.63	1.582
	Yes	3.54		
Expected Return	No	3.60	0.26	0.352
	Yes	3.86		
Risk Type	No	2.60	0.36	1.063
	Yes	2.24		
Bitcoin Payment Method	No	3.00	0.17	0.101
	Yes	2.83		
Cryptoinvestment Speculation	No	4.00	0.31	0.722
	Yes	4.31		
Regulation of Cryptoinvestment	No	3.40	0.71	1.053
	Yes	2.69		

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

TABLE XI. MEAN ANALYSIS INVESTMENT BEHAVIOR IN ETHEREUM VS RISK EXPECTATION

	Investment in Ethereum	Mean	Difference in Means	ANOVA F
Risk Appetite	No	3.80	0.22	0.256
	Yes	3.58		
Expected Return	No	3.33	0.67	3.922
	Yes	4.00		
Risk Type	No	2.22	0.10	0.119
	Yes	2.32		
Bitcoin Payment Method	No	2.90	0.07	0.025
	Yes	2.83		
Cryptoinvestment Speculation	No	4.00	0.38	1.802
	Yes	4.38		
Regulation of Cryptoinvestment	No	2.70	0.13	0.060
	Yes	2.83		

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

Considering Tables XII and Table XIII, the relation between the investments in Bitcoin and Ethereum are related to the return development as well as the belief in cryptocurrencies. In average, an investment or non-investment in Bitcoin does not lead to a different value expectation of the investment. In addition, investors or non-investors do not anticipate differently regarding cryptocurrencies. For Bitcoin investment in all cases the F-scores are below the mark of 3.90. For this reason, all the ANOVA analyses are insignificantly and a difference in means regarding the single variables and the investment in Bitcoin can be excluded.

Reviewing the investors in Ethereum in relation to the return expectations, it can be mainly determined that also the most ANOVA-tests have F-scores below the mark of 3.90. This means, the F-Tests are insignificantly. For this reason, there is no difference in means between the investors and non-investors regarding the different variables. However, in comparison to the investors in Bitcoin, one expectation indicates a significant F-test. Regarding the variable, a promising high rate of return, the F-score exceeds the mark of 3.90. On this account, there is a difference in means between the investors and non-investors in Ethereum. The variation is that non-investors have a neutral expectation regarding a promising high rate of return of Ethereum investments. Oppositely, averagely investors in Ethereum believe in a high rate of return.

TABLE XII. MEAN ANALYSIS INVESTMENT BEHAVIOR IN BITCOIN VS PERFORMANCE EXPECTANCY

	Investment in Bitcoin	Mean	Difference in Means	ANOVA F
Long-term Store of Value	No	3.67	0.43	0.474
	Yes	4.10		
Short-term Store of Value	No	2.40	0.80	1.371
	Yes	3.20		
Promising High Rate of Return	No	3.80	0.07	0.009
	Yes	3.87		
Digital Payment Method	No	3.20	0.03	0.002
	Yes	3.23		
Belief in Alter-native Currency	No	4.00	0.50	0.481
	Yes	3.50		
Usage of Alternative Currency	No	3.20	0.10	0.018
	Yes	3.10		

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

Although the outcomes have mainly no difference in means, it must be concluded that the investors in cryptocurrencies expect in general a long-term store of value by doing cryptoinvestments. Considering the beliefs in the cryptocurrencies as well as the short-term store of value, the investors in cryptocurrencies have generally a neutral attitude.

Concluding the ANOVA-tests by considering, how the investors in Bitcoin and Ethereum averagely estimate how their investments will develop in the upcoming year. Before going in the estimations of the average responses, it needs to be underlined that the investors of cryptocurrencies (independently if Bitcoin, Ethereum or something else), the investors do not anticipate a total loss of their investments. Furthermore, they more likely expect a rise of their investments.

TABLE XIII. MEAN ANALYSIS INVESTMENT BEHAVIOR IN ETHEREUM VS PERFORMANCE EXPECTANCY

	Investment in Ethereum	Mean	Difference in Means	ANOVA F
Long-term Store of Value	No	3.64	0.55	1.262
	Yes	4.21		
Short-term Store of Value	No	2.60	0.68	1.666
	Yes	3.28		
Promising High Rate of Return	No	2.90	1.34	7.917**
	Yes	4.24		
Digital Payment Method	No	2.70	0.58	1.028
	Yes	3.28		
Belief in Alter-native Currency	No	3.30	0.38	0.463
	Yes	3.68		
Usage of Alternative Currency	No	2.90	0.46	0.589
	Yes	3.36		

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

TABLE XIV. MEAN ANALYSIS INVESTMENT BEHAVIOR IN BITCOIN VS STORAGE DEVELOPMENT

	Investment in Bitcoin	Mean	Difference in Means	ANOVA F
Downtick in 6 Months	No	3.40	0.54	1.482
	Yes	2.86		
Uptick in 6 Months	No	4.40	1.01	5.587*
	Yes	3.39		
Downtick in 12 Months	No	3.60	1.35	9.062**
	Yes	2.25		
Uptick in 12 Months	No	4.20	0.23	0.380
	Yes	3.97		
Total Loss	No	2.00	0.07	0.018
	Yes	1.93		

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

This is also underlined in Tables XIV and XV with the positive estimation about an uptick of the cryptocurrency investment. Furthermore, investors in cryptocurrencies do not averagely expect a downtick of the investment within an investment period of 12 months. Interestingly, investors, who do not invest in cryptocurrencies but in other kinds of

investments, see cryptocurrency investments more critically and averagely expect a downtick of an investment in Bitcoin or Ethereum. In general, it can be expected that investors expect a greater risk in doing cryptocurrency investments. Oppositely, the non-investors in cryptocurrencies have a more positive opinion about the return progression of the cryptocurrency investments.

TABLE XV. MEAN ANALYSIS INVESTMENT BEHAVIOR IN ETHEREUM VS STORAGE DEVELOPMENT

	Investment in Ethereum	Mean	Difference in Means	ANOVA F
Downtick in 6 Months	No	3.10	0.22	0.415
	Yes	2.88		
Uptick in 6 Months	No	3.78	0.32	0.753
	Yes	3.46		
Downtick in 12 Months	No	3.00	0.75	3.742
	Yes	2.25		
Uptick in 12 Months	No	3.80	0.28	0.933
	Yes	4.08		
Total Loss	No	2.20	0.37	0.869
	Yes	1.83		

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

However, looking for the F-test, it must be stated that the ANOVA-analysis does not figure out a difference in means in the relation between the return progression and the investment in Ethereum. All the outcomes in Table XV do not reach a F-value greater than 3.90. The F-tests are insignificantly and there is not a difference in means in the expectations about the development of Ethereum between the investors and non-investors in Ethereum.

Considering the ANOVA for the relation between the investment in Bitcoin and the return expectation within the following 12 months. In general, three of five F-tests also identify values below the mark of 3.90, which are insignificantly and do not figure out a difference in means. However, regarding an uptick of Bitcoin within the next six months as well as a downtick in the next twelve months, the F-tests reach scores about the mark of 3.90. For these two questions, the investors and non-investors in Bitcoin have averagely a different expectation about the return development.

Interestingly, for the uptick within the six months, the non-investors in Bitcoin have a more positive expectation about the Bitcoin development than the investors in Bitcoin. Oppositely, within twelve months, the investors in Bitcoin reject a possible expectation about a downtick of the development, whereas the non-investors think about that averagely it would be likely that the Bitcoin investment gets a downtick.

E. Correlation Analysis

The correlation analysis measures the degree of the relationship between two individual variables. It is not, however, the degree of the linear proportionality. A correlation of 1.000 shows a 'perfect' relationship. A correlation coefficient higher than 0.500 is classified as a good correlation. Below 0.300, the correlation coefficients are weak [66][67].

The first correlation analyses build the pre step for the further investigations. For this reason, the correlations will be considered between the intent to use investment (to be an investor) and the variables considering the return and risk.

TABLE XVI. SIGNIFICANT CORRELATIONS FOR THE INTENTION TO USE INVESTMENTS

Variables	Correlation Coefficient
Risk Appetite	0.294
Expected Returns	0.262
Risk Type	0.355
Belief in Alternative Currency	0.349

TABLE XVII. SIGNIFICANT CORRELATIONS FOR THE INTENTION TO USE CRYPTOCURRENCIES

Variables	Correlation Coefficient
Total Loss	-0.349
Risk Appetite	0.475
Expected Returns	0.479
Risk Type	0.513
General Investment	0.728
Investment Duration	0.388
Year of First Investment	0.508
Bitcoin Alternative Payment Method	0.242
Long-term Store of Value	0.539
Short-term Store of Value	0.366
Promising High Rate of Return	0.511
Digital Payment Method	0.350
Belief in Alternative Currency	0.434
Usage of Alternative Currency	0.345

Based on the results in Table XVI, a positive significant relationship can be found between the general investment behavior as well as the risk taken and the expected return. Investors make investments to generate profits or to increase their financial resources. Therefore, the correlation with the expected return can be comprehended. Considering the

relation to the risk expectation, it can be followed those investors, who already have decided to invest, anticipate the possible risk they have to face.

TABLE XVIII. SIGNIFICANT CORRELATIONS FOR THE BITCOIN COURSE DEVELOPMENT

Variables	Correlation Coefficient
Uptick in 6 Months	**-0.391**
Downtick in 12 Months	**-0.476**

TABLE XIX. SIGNIFICANT CORRELATIONS FOR THE ETHEREUM COURSE DEVELOPMENT

Variables	Correlation Coefficient
Expected Returns	**0.440**

This means, investors are normally aware that they that they do not gain a financial profit or could lose their investments. Otherwise, non-investors, who reject to invest, are normally not willing to take the risks to possibly lose the financial resources. When investing, it must be clear that a loss as well as a possible is possible.

Table XVII shows the variables that have a significant correlation with the intention to use cryptocurrencies. In addition to the values shown in Table XVII: (a) There are positive significant correlations for all variables of perceived risk and experience with the intention of using cryptocurrencies. (b) From the concept of performance expectancy, the variable of the expectation regarding the total loss of an investment in cryptocurrencies correlates negatively significant with the intention to use cryptocurrencies. The negative correlation identifies that the investors in cryptocurrencies do not expect a total loss of their taken investments. This result corresponds with the positive correlations between the intention to use cryptocurrencies and the rate of return. On this account, users of cryptocurrencies expect to get a positive return from their investment.

Finally, in Tables XVIII and XIX, it can be remarked that the outcomes of the mean analyses can be supported. For this reason, the negative correlations for the investment in Bitcoin and the development of the investment identify those investors, who do not invest in Bitcoin, have a better expectation about the Bitcoin development than the actual investors. Oppositely, investors in Bitcoin do not expect a reduction of the invested financial resources in the Bitcoin investment. Although they are more carefully in the expectation regarding a positive development of the investment in the short run, in the long run, the investors do not expect a loss of financial resources within the investment.

F. Regression Analyses

As introduced earlier, the regression analysis will be performed on the method of an ordinary least squares regression. The intension is to verify if the dependent variable behavioral intention to use cryptocurrencies is affected by the developed three concepts of independent variables [67]. In this regard, it will be examined, in which degree the predictor variables can explain the generated values of the dependent variable [68].

In the application of the regression analysis, four major indicators need to be considered. Firstly, the r-square will be determined to quantify the explanatory power of the whole regression model. The r-square is the share of the dependent variable, which can be explained by the independent variables. Following Chin and Cohen, the value should be at least 33% [69][70].

Secondly, the analysis of the variances (ANOVA) needs to verify the model fit. The resulting values should be significant ($p<0.05$) and higher than 3 in order to evaluate the model as good, which is the case here.

Thirdly, the regression coefficients of the independent variables need to be significant ($p<0.05$). In particular, the identified estimators must match the expectations in the research hypotheses. Fourthly, the test of multicollinearities by the Variance Inflation Factor (VIF) needs to be performed to find out, whether the variables included in the regression analyses have an identical relation. In the case of existing multicollinearities, i.e., if the VIF values exceed 10 (or in a stricter definition 3), the outcomes of the regression analysis are biased [61][71][72].

TABLE XX. REGRESSION ANALYSIS – PERCEIVED RISK:

Independent variables	Dependent: Intention to Use Cryptocurrencies	
ANOVA = 13.932 p<0.05	**R-Square = 35.2%**	
	Regression Coefficients with Significance	**VIF**
Risk Appetite	**0.052**	**2.656**
Expected Return	**0.143****	**1.328**
Risk Type	**0.182***	**2.524**

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

TABLE XXI. REGRESSION ANALYSIS – PERFORMANCE EXPECTANCY

Independent variables	Dependent: Intention to Use Cryptocurrencies	
ANOVA = 4.434 p<0.05	**R-Square = 12.2%**	
	Regression Coefficients with Significance	**VIF**
Total Loss	**-0.057****	**1.000**

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

In performing the regression analysis, the relation between the variables of perceived risk and the intention to use cryptocurrencies are investigated (see Table XX). In general, the r-square achieves a score of 35.2%. Since this value is

slightly above the mark of 33%, there is at least a sufficient explanatory rate of the values of the dependent variable. The ANOVA scores an F-Ratio above the mark of 3.90.

The expected return positively significantly affects the intention to use cryptocurrencies. This means, when investors expect a higher return, they are more open to use cryptocurrencies. In addition, the affinity for risk relates positively significantly but weakly with the intention to use cryptocurrencies. If investors are open to speculate and to take higher risks in investments, they intent to use cryptocurrencies for their investments. The VIF-values are below the mark of 3, so it can be excluded those multicollinearities are within the assumed model.

In Table XXI, the variable of the expectation regarding a total loss of the investment is related to the intention to use cryptocurrencies. The r-square of the regression is 12.2%. Surely, the mark is below 33% and therefore, the explanatory rate seems to be low. In comparison to the other concepts, the expectation of a total loss of an investment in cryptocurrencies reaches a high r-square regarding that only one variable in the regression is considered. The F-Ratio of the ANOVA indicates a value better than the mark of 3.90 and therefore, a model fit is given. The variable total loss is negatively significant related to the intention to use cryptocurrencies.

The negative relationship remarks that investors perceive those investments in cryptocurrencies are very improbable to lead to a full loss of the investment. This induces the openness for and investments in cryptocurrencies. Since there is only one variable, there cannot be any multicollinearities.

In Table XXII, the variables of the concept experience are directly related to the intention to use cryptocurrencies. The r-square of 45.8% describes a low to moderate explanatory rate of the values occurring by the dependent variables. At least two fifths of the values of the dependent variable intention to use cryptocurrencies can be explained by applying the independent variables covering the concept of experience. The F-Ratio of 8.734 remarks an existing model fit.

TABLE XXII. REGRESSION ANALYSIS – EXPERIENCE

Independent variables	Dependent: Intention to Use Cryptocurrencies	
ANOVA = 8.734 p<0.05	R-Square = 45.8%	
	Regression Coefficients with Significance	VIF
General Investment	0.365**	1.090
Investment Duration	0.038**	1.061
Year of First Investment	0.034	1.134

* Significant within the error probability of 10%.
** Significant within the error probability of 5%.

In the concept experience, two variables are positively significant with the intention to use cryptocurrencies. Firstly, the general investment behavior positively affects to the intention to use cryptocurrencies. In general, in case investors do regularly investments (indifferently in which field) they are more open to intent to use investments in cryptocurrencies. Secondly, the variable, which includes the investment duration, is positively significant related to the intention to use cryptocurrencies. This means, investors are more oriented in a long-term store of value. If they behave in this direction, they see cryptocurrencies also as opportunity to invest over a longer time. If investors want to invest for a longer period of time, they are more intent to use cryptocurrencies for their investments. The VIF-scores identify those multicollinearities can be excluded in the model.

Finally, in a combined regression, all independent variables of the three individual regressions are used together. The combination of the independent variables leads to an enhancement to the level of 70.1%. Comparing the resulting r-square to the mark of 33%, the combined approach identifies a high level of explanatory power. In this regard, nearly three quarters of the data points of the dependent variable can be explained by the application of the independent variables. The F-Ratio of 8.041 identifies a good model fit. Through combining all independent variables of the previous regression analyses, only the variable covering the general investment behavior affects positively significant the intention to use cryptocurrencies. When investors have more experience with the application and execution of investments in general, they are more open and willing to use cryptocurrencies. This effect seems to be the most dominant one in the model, since all the other independent variables are getting insignificantly when they are considered in the combined approach. It can be assumed that investors in cryptocurrencies are persons, who have done investments in the past. Therefore, if persons are familiar with investments, they are more willing to do investments in cryptocurrencies.

However, the combined approach identifies two variables (risk appetite and risk type), which have VIF-values above the mark of 3. In this regard, the combined approach cannot fully guarantee that no multicollinearities are within the model. For this reason, the regression coefficients could be biased by the overwhelming effects of the independent variables, which are strongly correlating with each other.

VI. Conclusions And Future Work

The mean analyses underline the importance of Bitcoin as sign for the whole cryptocurrencies. In this regard, the outcomes of the regression and correlation analyses are influenced from the aspect that in the most cases, the investors anticipate Bitcoin with the term cryptocurrency. Although cryptocurrencies are implemented for solving several kinds of transactions, most of the investors see cryptocurrencies with the type of Bitcoin, an alternative payment method with speculation options.

Summarizing the regression analyses, the hypotheses H1 to H3 can be accepted. In general, when investors have made

investments in the past, they are more open to use cryptocurrencies. This result is supported by the fact that how longer the investors do investments and have a long-term store of value, they intent to use cryptocurrencies. In addition, if the investors expect to experience not a total loss of the investment in cryptocurrencies, they have a higher willingness to use cryptocurrencies. Lastly, investors, who do investments with a greater risk, they have also a greater intent to use cryptocurrencies for their investment to reach higher returns.

To sum up, all three concepts identify significant variables, which are influencing the intention to use cryptocurrencies. For this reason, the assumed research model and hypotheses can be fully confirmed. However, as remarked in the beginning, the sample size of the whole analysis is too low. On this account, the achieved results cannot be generalized, and further quantitative analyses and surveys are necessary to deepen the influence factors of cryptocurrencies. As this is a very topical issue, the authors expect that further research works will be performed, which focus on the influence factor for the adoption of Bitcoin, Ethereum and further currencies.

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