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The determinants of trust and perceived risk on bitcoin users

Los determinantes de confianza y riesgo percibido sobre los usuarios de bitcoin

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Abstract

One of the possible determinants of the intention to use bitcoin may be the trust of users because in the short time of validity of the cryptocurrency has proven to be a real option against fiat money. In this regard it should be added that few studies consider trust as a determinant of the use of Bitcoin; therefore, the purpose of this research is to know what are the factors on which trust is based and to know to what extent the perceived risk has a negative connotation on the use of cryptocurrency. To accomplish this, a model is integrated and is analyzed under the methodology of structural equations by partial least squares (PLS-SEM), applied to a sample of 174 bitcoin users. The evaluation of the seven theoretical hypotheses indicates that the key elements of trust are structural guarantees and familiarity since they determine the intention of use and this, in turn, the actual use; unlike calculative-based trust and situational normality, which are not very significant. The perceived risk was shown to have little relation to the intended use. Therefore, Bitcoin-related service providers should focus on generating trust situations for users based on security and regulations and creating environments that generate familiarity.

Resumen

Uno de los posibles determinantes de la intención de usar bitcoin puede ser la confianza de los usuarios, ya que en el poco tiempo de vigencia de la criptomoneda ha demostrado ser una opción real frente al dinero fiduciario. En este aspecto, cabe añadir que existen pocos estudios que consideran a la confianza como un determinante del uso de bitcoin, por lo que el objetivo de este estudio es investigar los factores en los que se basa la confianza y conocer hasta qué punto el riesgo percibido tiene una connotación negativa sobre el uso de la criptomoneda. Para ello se integra un modelo que es analizado bajo la metodología de ecuaciones estructurales por mínimos cuadrados parciales (PLS-SEM), aplicado a una muestra de 174 usuarios de bitcoin. Los resultados de la evaluación de siete hipótesis teóricas indican que los elementos clave de la confianza son las garantías estructurales y la familiaridad ya que determinan la intención de uso y este a su vez el uso real; a diferencia de la confianza basada en las garantías estructurales y la normalidad situacional que son poco significativas. El riesgo percibido demostró tener poca relación con la intención de uso. Por lo tanto, los proveedores de servicios relacionados con bitcoin deben enfocarse en generar situaciones de confianza para los usuarios basadas en la seguridad y las regulaciones, además de crear entornos que generen familiaridad.

Keywords | palabras clave

Trust, perceived risk, behavioral intention, bitcoin, digital transactions, PLS-SEM model, structural assurances.
Confianza, riesgo percibido, intención de uso, bitcoin, transacciones digitales, modelo PLS-SEM, garantías estructurales.

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Introduction

The digitization of the economy has transformed economic activities to be more effective and flexible, the economic crisis caused by Covid-19 and the health measures imposed by governments around the world create environments where transactions by digital means are more important (Yeong et al., 2019). From January 2019 to April 2021, in the midst of the crisis, the total market value of cryptocurrencies multiplied 15 times with an approximate market value of one trillion dollars (Anglo-Saxon), equivalent to the 2021 GDP of countries like Mexico, Spain or Switzerland, with more than 10 000 different cryptocurrencies in the market (Coinmarketcap, 2021), therefore a study on the subject can help companies or governments to know the advantages of cryptocurrencies, as is the case of the digital yuan and the evolution of the financial market infrastructure since there are more than 100 million confirmed users in the world (Blandin et al., 2020).

Lately, significant progress has been made regarding the understanding of trust in electronic commerce and, therefore, in cryptocurrencies, since trust becomes more significant in these areas, making it difficult to verify regulations, uses, and customs in commerce and In all digital transactions, communication networks are now more linked to financial services as mobile banking offers more benefits over traditional banking, such as balance verification and instant fund transfer (Afshan & Sharif, 2016; Gefen et al., 2003; Kim et al., 2009). Commerce through electronic means goes beyond its interface, trust is an element that goes beyond the transactional relationships of users, especially those that contain some aspect of risk (Gefen et al., 2003).

Due to the particular characteristic of virtuality, cryptocurrencies could imply a great risk and uncertainty, which reduces their trust for being adopted. Trust corresponds to the expectation that others will not behave opportunistically, that the other party will fulfill their obligations despite their dependence and vulnerability, making certain regulation necessary, since, when there is no minimum effective regulation in digital media, users have to trust the technology they will use (Gefen et al., 2003; Zhou, 2012). To do this, the concept of trust is reviewed in relation to bitcoin and cryptocurrencies, the theories that explain it, and how it can be measured; secondly, the factors that generate trust are analyzed in order to know how these factors contribute to achieving the objectives of this research work; third, a conceptual model is presented incorporating its methodological analysis; fourth, the results of the application of the model are presented and finally a discussion of the results is carried out, including the conclusions.

1.1. Theoretical framework

1.1.1. Bitcoin

Bitcoin has emerged as a new alternative to payment methods, with multiple benefits for users such as anonymity and low transaction fees (Yeong et al., 2019). It consists of a public and decentralized payment system that is based on Blockchain technology, which consists of a record of all the transactions that are carried out (Inoue, 2016). Blockchain technology requires that all payment system procedures be carried out by voluntary users who provide processing capacity through their computers, they confirm the transactions and process the data that is added to the chain, all transactions, and new Blocks generate commissions that are distributed equitably (Sadhya et al., 2018).

1.1.2. Trust

Trust has been proposed as a one-dimensional construction, ignoring the large amount of evidence that suggests that it is a complex construction and of a multi-dimensional nature, for which we conduct a review of the factors that lead to trust, each one contributes to a perspective of this concept since it can take different forms and relationships, therefore trust in digital media is a combination of multiple factors (Gefen et al., 2003; Kim & Prabhakar, 2004). Trust is a multidimensional construction, which occurs in digital media, despite the lack of human interaction, which explains its importance (Gefen & Straub, 2004).

Trust can be defined as a combination of reliability, integrity, and benevolence of electronic providers with the belief that these generate behavioral intentions among consumers, a definition that separates trust from actual behavioral intentions since trust positively affects them (Gefen et al., 2003; Mayer et al., 1995). In digital media, there is no detailed contract that grants legal protection or that binds the parties when it is breached, therefore the experience that occurs between users generates trust since it establishes the credibility on the part of the seller that it will provide what is promised. (Villarroel-Puma & Berenguer-Contri, 2020; Gefen et al., 2003).

There are different antecedents of trust that help to better understand this concept, for example: 1) familiarity, suggests that trust develops over time, resulting from experience between the parties (Gefen et al., 2003); 2) trust based on calculation: it is based on economic principles since the creation of trust implies a calculating process (Gefen et al., 2003); 3) trust based on the institution, refers to the evaluation that the transaction will be successful based on what is usual in situations of this type (Gefen et al., 2003); 4) trust based on structural guarantees, refer to the evaluation of success due to safety nets, legal resources and regulations (Gefen et al., 2003); 5) the propensity to trust, refers to the fact that trust depends on an individual's willingness to trust (Gefen & Straub, 2004); 6) predictability: it is the belief that the seller will behave reliably (Gefen & Straub, 2004).

The foregoing shows that a new type of trust has emerged based on technology, which must be considered in a multidimensional way, in order to know which factors better explain it, which we will analyze in more detail below.

1.1.3. The perceived risk

Perceived risk is the disposition of individuals towards risk (Diez-Farhat, 2020), the literature indicates that it is a very important element, especially in those impersonal relationships in which a risk situation is contemplated and that trust should not be analyzed trust without considering risk, especially in relationships where there is uncertainty, the inclusion of this variable is very important since the decision to use a technology or not is based on a cost-benefit analysis, thus risk must play a central role (Gefen et al., 2003; Pavlou, 2003). There are studies that have analyzed risk, finding that users perceive a high risk when using electronic services and cryptocurrencies since it is a factor that hinders the behavioral intention (Alalwan et al., 2018; Esmaeilzadeh et al., 2019; Xie et al., 2017).

In the present context, we adopt this position in the face of risk as a negative connotation about the user's intentions to use some technology that leads an individual to incur a loss in the search for a result.

1.1.4. Empirical evidence

The adoption of cryptocurrencies has been analyzed in different ways. Table 1 provides a brief description of the acceptance and trust studies that have been done on

cryptocurrencies and bitcoin, it shows which acceptance theories have been applied, the methodologies that have been used to analyze data, and the main results. Despite the apparent maturity derived from this comparison, none of them analyze multidimensional trust or include perceived risk.

It was found that all the reviewed works present an adequate application of the different theoretical variables of the acceptance models, integrating them with the concept of trust, in all of them the reliability and validity of the models were successfully verified, all studies showed that Trust is one of the most important elements, consequently this element should be analyzed in-depth (López-Zambrano & Camberos-Castro, 2020; Mahomed, 2017; Roos, 2015; Shahzad et al., 2018). It is shown that there are few studies that analyze trust in bitcoin or cryptocurrencies and that, of the four mentioned above, none values it in a multidimensional manner, nor is perceived risk a complement to trust. While it is true that trust is a determining factor in the use of cryptocurrencies, it is necessary to make a multidimensional analysis and include perceived risk to know which elements are the most important (Gefen et al., 2003).

Table 1. Review of empirical evidence

Author	Theory and concepts	Context	Methodology	Results
Mahomed (2017)	UTAUT2 and trust	Adoption of cryptocurrencies	Multiple linear regression	Trust 25 %. The model explains 29 % of the intention.
Roos (2015)	UTAUT2 and trust	Adoption of cryptocurrencies in SMEs	Descriptive analysis	The study shows that trust is the most important factor.
Shahzad et al. (2018)	TAM, Consciousness, and confidence	Adoption of cryptocurrencies in China	SEM	The model manages to explain 51 % of the intention, with trust being the determining factor.
López y Camberos (2020)	UTAUT2 and trust	Bitcoin adoption in Mexico.	PLS-SEM	The model manages to explain 79.3 % of the intention to use and 30.6 % of the actual use.

Source: López-Zambrano and Camberos-Castro (2020); Mahomed (2017); Roos (2015); Shahzad et al. (2018).

1.1.5. Integration of the conceptual model

When analyzing the different models and theories of trust we find that the Gefen (2003) model is the one that best adapts since it contemplates the part of the initial trust considering that the phenomenon of cryptocurrencies is relatively new, since it has been in force since 2008 (Nakamoto, 2008). In turn, the variables of this model contemplate other dimensions that manage to synthesize different concepts into one (Aljaafreh et al., 2014; Kim et al., 2009; Sun et al., 2017).

Risk is analyzed one-dimensionally because the perceived risk scale used by Xie et al. (2017) was validated and proved to be robust considering all the dimensions proposed by Featherman and Pavlou (2003) and Lee (2009).

Therefore, the model in Figure 1 where the exogenous variables of trust based on calculation, trust based on structural guarantees, situational normality, and perceived

risk that affect the endogenous variables of trust, intention to use, and actual use is proposed. Trust and perceived risk are found to be the most important elements for bitcoin to be accepted. The objective of the model is to try to measure the relationships of a user when initiating contact with a new technology and how they increase with the interaction, generating the necessary trust, without it, the user will not use said technology (Alalwan et al., 2017; Aljaafreh et al., 2014; Sun et al., 2017).

In order to better guide the analysis, different hypotheses of how the factors of the integrated model affect the intention to use are described below:

H1. Trust bases on calculation (CB) Positively Affects Trust in Bitcoin

Calculation-based trust occurs when the seller has nothing to gain by not being trustworthy, but Blockchain technology turns bitcoin into a decentralized means of payment that is not controlled by any person or institution, which makes it a service with integrity and trustworthiness, although there are companies and individuals that provide their services through bitcoin such as online wallets or exchangers that generate income through commissions, it is expected that these companies have a lot to lose by not be reliable and a lot to gain from using Blockchain.

H2. Perceptions of structural guarantees (SA) built into bitcoin positively affect user confidence

Trust based on structural guarantees refers to the evaluation of success due to the resources of Blockchain technology, which supports bitcoin and allows to have a secure payment network that is impossible to break (Sadhya et al., 2018). Although it is true that currently, most countries in the world have laws that regulate the use of bitcoin and the companies that offer their services through it, these may still have loopholes. It is expected that companies that offer their services through bitcoin, especially those that operate in the cloud, must offer the necessary structural guarantees.

H3. The perception of situational normality (SN) positively affects trust in bitcoin

Trust based on the institution in terms of situational normality refers to the fact that transactions are achieved because it is habitual, unlike familiarity, situational normality does not deal with knowledge of technology, but refers to the measurement in which the interaction with a certain technology is normal compared to other similar technologies (Gefen et al., 2003). When users make transfers through bitcoin, they are expected to be successful or when they store their assets in a bitcoin wallet, they expect them to be protected, similar to online banking.

H4. Familiarity (FL) with the use of bitcoin positively increases trust in it

Familiarity suggests that trust develops over time, with the interaction with technology that results in experience, which should increase trust since it implies greater experience derived from accumulated knowledge (Gefen et al., 2003). The use of bitcoin implies a progressive involvement on the part of the user since it is necessary to have technical and financial knowledge for its use, so an increase in knowledge and accumulated previous successful interactions lead to higher levels of trust.

H5. Trust (T) positively affects users' intention to use bitcoin

Trust can be defined as a combination of reliability, integrity, benevolence, and capacity of the user to use certain technology with the belief that behavioral intentions can be generated. Therefore, high levels of trust such as specific beliefs about a technology increase the intention of use (Alalwan et al., 2017; Gefen et al., 2003). Trust in

bitcoin helps the user to subjectively rule out undesirable situations derived from its use, especially by service providers.

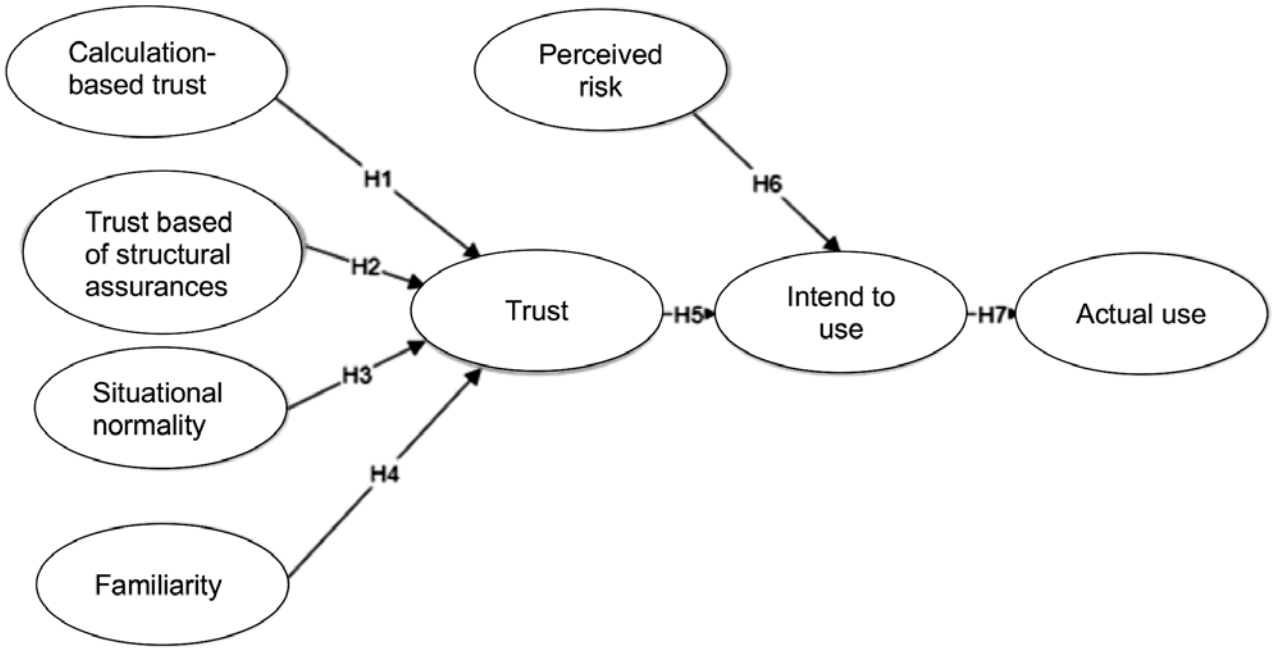
H6. Perceived risk (PR) has a negative effect on the intention to use bitcoin

Perceived risk refers to the belief of an individual to incur a loss in search for a result, the interest in this factor is due to the high uncertainty, intangibility, and the absence of human interaction of online transactions (Alalwan et al., 2018; Xie et al., 2017). The financial risks when using bitcoin have proven to be one of the main obstacles when adopting it due to its high volatility, as well as the possible security breaches that bitcoin service providers such as wallets or exchange houses may suffer (Abramova & Böhme, 2016; Sas & Khairuddin, 2015). Thus, an increase in the feeling of risk in users negatively affects the intention to use bitcoin.

H7. Intent to use (IU) positively affects actual use (AU) of bitcoin

The intention of use assumes that the actual use of bitcoin is predicted by the willingness of users to adopt this technology (López-Zambrano & Camberos-Castro, 2020).

Figure 1. Conceptual model



Source: Own elaboration with data from Gefen (2003).

2. Methodology

The structural equation model (SEM) is a technique to estimate causal relationships applying a combination of statistical data that allows researchers to test theories, concepts and verify the relationships between variables at theoretical levels (Hair et al., 2018; Hair et al.., 2012; Oliveira et al., 2016; Owusu-Kwateng et al., 2019). The SEM model can be approached from the technique based on covariance (CB-SEM) which minimizes the discrepancy between covariance matrices or by means of structural equations by partial least squares (PLS-SEM) that maximizes the explained variance of the variables (Hair et al., 2016; Oliveira et al., 2016). This second technique is less

restrictive in terms of data distribution and indicates that the sample size must be greater than 10 times the number of trajectories that point to some variable, in this case, the minimum sample size to consider is 70 (Hair et al., 2016; Zhou et al., 2010). The distribution of the sample was evaluated through the Kolmogorov-Smirnov (K-S) test, detecting that the data are not normally distributed since the significance levels were less than 0.05. Based on the above, the PLS-SEM model is the most consistent method for this type of study, considering that the anonymous nature of the use of cryptocurrencies does not allow very large samples to be obtained (López-Zambrano & Camberos-Castro, 2020; Oliveira et al., 2014).

Another reason for using the PLS-SEM technique is that it uses reflective indicators and that the study tries to predict fundamental constructs such as trust and risk, which are based on an exploratory investigation as they are a recent phenomenon. For this, the statistical software package SMART -PLS version 3.3.2 is the most appropriate for the analysis of results (Leyva et al., 2014).

2.1. Measurement

Based on the background review proposed in the theoretical section, an electronic questionnaire was developed and tested to improve it, and an electronic questionnaire was applied through the Google Forms platform in Spanish, which was validated in front of a panel of experts in the areas of economics and finance, the items and the scales related to trust were adapted from Gefen (2003), the items and the perceived risk scale were adapted from Xie et al. (2017), to measure the constructs, 26 reflective indicators (questions) related to each variable were used. The unit of analysis of this study is Bitcoin users in Mexico and the responses are measured through a 7-point Likert scale at interval levels ranging from "totally disagree" to "totally agree". The frequency of use was measured on a scale ranging from "never" to "several times a day". The demographic questions that are included are related to age, gender, and educational level in order to know the environment of the users. In order to carry out a pilot test, the questionnaire was distributed through the Airbit Club platform related to cryptocurrencies. Preliminary evidence indicated that the scales were valid and reliable; It should be noted that these responses were not included in the final results.

2.2. Data

In order to detect the largest number of bitcoin users, a non-probabilistic sampling was chosen for convenience since the anonymous nature of this cryptocurrency makes it difficult to obtain data, one of the advantages of this approach is that it obtains reliable and accurate information since the respondents are familiar with the subject of study (Owusu-Kwateng et al., 2019). Through the Autonetworks software, 13 groups of users of the social network Facebook were detected, only in Mexico, since it would take too long to consider other countries because the software used only allows sending 100 personalized messages per day, of which we extracted the names of 9000 users to whom the survey was sent through personalized messages, obtaining 174 responses validated with statistical tools that are explained in detail in the following section.

3. Results

The response profile of the respondents is observed in Table 2 where only 11 % are women, the average age is 32 years and the majority (76 %) have a university degree.

Table 2. Demographic information

	#	%
Gender		
Male	154	88.5
Female	19	10.9
Other	1	0.6
Age		
Under 20	6	3.4
21-25	43	24.7
26-35	69	39.7
36-45	39	22.4
Over 46	17	9.8
Education		
Primary	2	1.1
High school	6	3.4
Preparatory	34	19.5
Bachelor's degree	104	59.8
Postgraduate	28	16.1

Source: Own elaboration

3.1. Measurement model analysis

In order to know the reliability and validity of the model, the internal consistency, the reliability of the indicator, the convergent validity, the average of the extracted variance (AVE), and the discriminant validity are calculated (Hair et al., 2014). To measure the internal consistency of the measurement model, the composite reliability (CC) and Cronbach's alpha were evaluated, whose values must be greater than 0.70 as indicated in Table 3 (Alalwan et al., 2017; Oliveira et al., 2014).

Table 3. Internal consistency and validity

Variable	Cronbach's α	CC	AVE	Ítem	Indicator
Calculation-based	0.821	0.893	0.735	BC1	0.861
				BC2	0.854
				BC3	0.856
Trust	0.903	0.933	0.777	T1	0.929
				T2	0.824
				T3	0.853
				T4	0.915
Familiarity	0.735	0.849	0.66	FL1	0.584
				FL2	0.908
				FL3	0.902

Variable	α de Cronbach	CC	AVE	Ítem	Indicador
Structural guarantees	0.856	0.903	0.7	SA1	0.874
				SA2	0.865
				SA3	0.892
				SA4	0.702
Intent of use	0.888	0.923	0.75	IU1	0.869
				IU2	0.832
				IU3	0.936
				IU4	0.823
Situational normality	0.867	0.918	0.789	SN1	0.876
				SN2	0.882
				SN3	0.906
Perceived risk	0.794	0.863	0.617	PR1	0.894
				PR2	0.882
				PR3	0.612
				PR4	0.717
Frequency	1	1	1	FREC	1

Source: Own elaboration

The reliability of the indicator helps us to know the convergent validity of the model, by eliminating an indicator it tells us if the composite reliability increases, the values must be greater than 0.5 as observed in Table 3 (Hair et al., 2014). Finally, it is observed in Table 3 that the AVE values are greater than 0.5, therefore each construct explains more than half of the variance, indicating that the constructs are valid and reliable (Hair et al., 2014; Mensah et al., 2020).

To satisfy the discriminant validity of the scales, they are evaluated using the Fornell-Larcker method, which establishes that the square root of AVE must be greater than all the relationships between each construct, thus each construct shares more variance with its indicators than with any other. Table 4 shows that the value of each variable is greater than that of its highest correlation (Hair et al., 2014; Oliveira et al., 2016).

Table 4. Fornell-Larcker criterion

	CB	T	FL	SA	IU	SN	PR	AU
CB	0.857							
T	0.305	0.881						
FL	0.158	0.702	0.812					
SA	0.402	0.817	0.568	0.837				
IU	0.285	0.777	0.652	0.717	0.866			
SN	0.36	0.35	0.334	0.503	0.304	0.888		
PR	-0.127	-0.251	-0.167	-0.243	-0.228	-0.086	0.785	
AU	0.083	0.281	0.38	0.224	0.407	0.074	-0.124	1

Source: Own elaboration

3.2. Structural model analysis

The structural model is analyzed after having confirmed the reliability and validity of the model, the causal relationships between the independent and dependent variables are analyzed through the determination coefficient (R2) (Leyva-Cordero & Olague, 2014). To measure the bias of the results, their collinearity is analyzed with the variance inflation factor (VIF), which must fluctuate between 0.2 and 5. Table 5 shows that the values of this analysis are in the allowed range, thus it can be said that there is no collinearity between the variables (Hair et al., 2014; Venkatesh et al., 2012).

Table 5. Multicollinearity Statistics (VIF)

	CZ	IU	AU
CB	1.257		
T		1.067	
FL	1.501		
SA	1.927		
IU			1
SN	1.405		
PR		1.067	

Source: Own elaboration

The Bootstrapping resampling technique is used to know the importance of the significance levels of the path coefficients because the PLS-SEM method uses non-normal distributions (Hair et al., 2012; Owusu-Kwateng et al., 2019). This technique extracts subsamples of the original data and estimates models for each subsample, in this case, they used 5000 estimates that were used to calculate the standard error and thus determine the importance of each parameter using the t-values (Hair et al., 2014). For this study, non-significant values were considered to be those greater than a probability error of 5 %. In this regard, Table 6 shows that confidence based on calculation does not significantly affect confidence, as does the perceived risk on the intention to use.

Table 6. Significance test

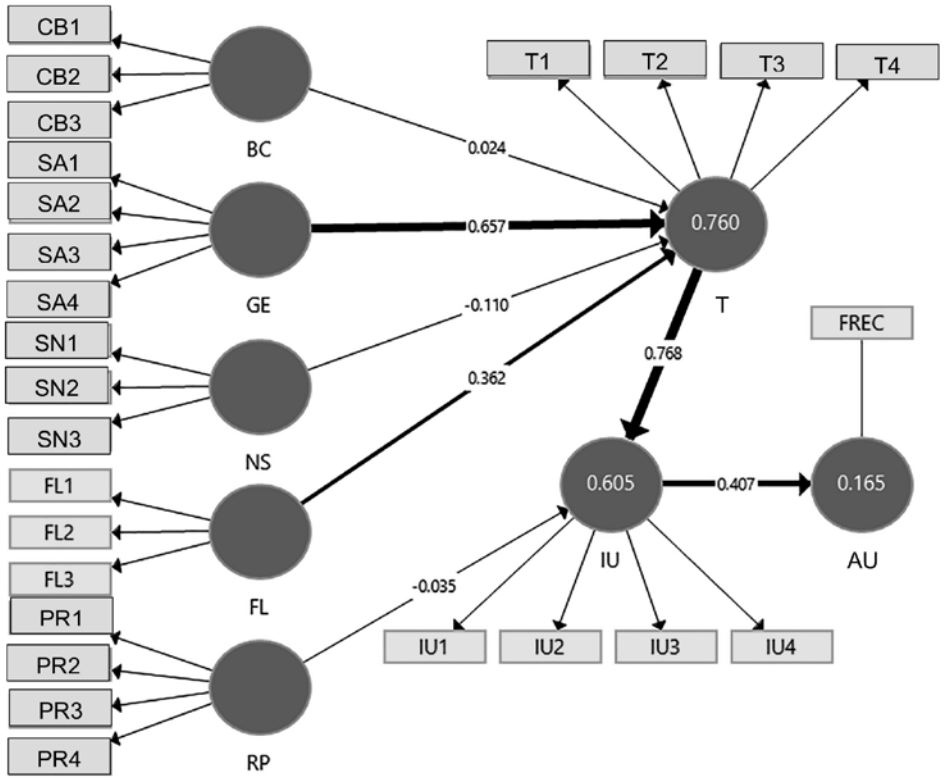
Trajectory	T Value (|O/STDEV|)	P value	Significance
CB -> T	0.584	0.559	Not significant
T -> IU	14.096	0	Significant
FL -> T	6.143	0	Significant
SA -> T	10.946	0	Significant
IU -> AU	4.607	0	Significant
SN -> T	2.211	0.027	Significant
RP -> IU	0.687	0.492	Not significant

Source: Own elaboration

The coefficient of determination R2 is a measure of predictive precision and corresponds to the combined effects of exogenous variables on endogenous variables, where values closer to 1 correspond to a higher degree of prediction (Hair et al., 2014; Vinzi et al., 2010). According to Hair et al. (2012), the recommended sample size to

obtain significant R2 values greater than 0.25 must be greater than 144, therefore values of 0.75, 0.50, and 0.25 are considered substantial, moderate, and weak respectively. In this regard, R2 helps us to interpret the statistical test of the hypotheses, in Figure 2 it is observed that the hypotheses H1, H3, and H6 are not significant, the hypotheses H2, H4, H5, and H7 are confirmed, the structural guarantees being the most important element, explaining 65.7 % of the trust and that only trust can predict 60.5 % of the intention to use.

Figure 2. Results of the structural model



Source: Own elaboration

Because the estimation of R^2 may not be enough to evaluate the entire structural model, it is necessary to carry out other procedures (Vinzi et al., 2010), thus the Q^2 value is used to know the predictive relevance of the model, it is measured through a data reuse technique that omits a part of them and predicts the omitted part by estimating the parameters of which values ranging from -1 to +1 are obtained, with values greater than 0 being those that imply high predictive relevance (Hair et al., 2014).

Table 7. Predictive relevance (Q^2)

Construct	Q^2	Significance
T	0.581	Significant
IU	0.444	Significant
AU	0.159	Significant

Source: Own elaboration

In this regard, the effect size (f2) is also evaluated by observing the changes in R2 when a specific construct is eliminated to evaluate the influence on the endogenous

variable, with values of 0.02, 0.15, and 0.35 representing small, medium, and large effects respectively (Hair et al., 2016). In turn, the effect size (f2) of Q2 can also be evaluated to know the relative impact of the predictive relevance q2 (Hair et al., 2016). In Table 8 it can be observed that familiarity and structural guarantees had a great effect on trust, as well as on the intention to use; the intention to use had a medium effect on the actual use, as for the other trajectories their effects were not relevant. Regarding q2, only FL and SA had a high predictive relevance on confidence.

Table 8. Effect size (f^2) and relative impact of predictive relevance (q^2)

Trajectory	f^2	q^2
BC -> CZ	0.002	-0.002
CZ -> IU	1.403	
FL -> CZ	0.363	0.165
GE -> CZ	0.933	0.418
IU -> UR	0.198	
NS -> CZ	0.036	0.014
RP -> IU	0.003	-0.009

Source: Own elaboration

4. Discussion and conclusions

There are different studies (Gefen, 2000; Gefen et al., 2003; Gefen & Straub, 2004; Kim et al., 2009; Kim & Prabhakar, 2004; Sun et al., 2017; Zhou, 2012) that point out the importance of analyzing trust as a complex and multidimensional variable and not just as an isolated element, a finding that was proven by López and Camberos (2020) in an investigation on the acceptance of bitcoin in Mexico. In this framework, according to statistical tests, the reliability and validity measurement model yielded positive results (Hair et al., 2012), highlighting that it has high predictive levels by explaining 60.5 % of the intention to use, in terms of Trust, the factor that best explains it is that of structural guarantees, with 65.7 % (Hair et al., 2016).

The analysis of the hypotheses shows that Trust based on calculations (H1) and the situational normality (H3) are not very significant since their effect and relevance are low, which shows that the intention to use bitcoin does not depend on the company that facilitates the wallet or exchange service and that users do not consider similar applications to use bitcoin (Gefen et al., 2003). Trust based on structural guarantees has a significant effect, since it explains most of it, confirming H2, being the main element of trust with an effect size (f2) and predictive relevance considered high. However, the problem is that trust is highly related to GE by means of the Fornell-Larcker criterion, where bitcoin guarantees exclude suspicious elements (Gefen et al., 2003), thus it is recommended to replace or combine this element with trust in future studies in order to generate models with the fewest possible variables.

In relation to familiarity, hypothesis (H4) is confirmed since it has a positive effect on trust by explaining 36.2 % of it, it also has a high effect and its relevance is significant. Thus, it can be said that users of bitcoin consider it necessary to review and be updated on the status of the cryptocurrency based on interactions with the Bitcoin interface and not on a social relationship (Gefen, 2000; Gefen & Straub, 2004). Regarding the perceived risk, the results are in accordance with the theory that men-

tions that it must have a negative impact on the intention to use, only that this is not very significant, therefore bitcoin users do not consider its use risky (Gefen et al., 2003). The effect of trust on the intention to use is significant and its predictive relevance is high, thus proving to be a very important element when explaining the acceptance of bitcoin. Thus, it is recommended to integrate the elements of trust with the acceptance models in order to obtain concise models that better explain the emergence of cryptocurrencies, especially in the long term (López-Zambrano & Camberos-Castro, 2020).

With the growing impact that cryptocurrencies, and in particular Bitcoin, have had on the economy, by using an appropriate theoretical basis in the context of the user integrating theories, the applicability of the model can be expanded by doing so in new areas of knowledge, especially with methods of advanced statistical analysis (PLS-SEM). In this context, one of the contributions is the inclusion of perceived risk, since it shows a significant contribution to the theory since it is considered one of the main obstacles for the intention to use. Another relevant theoretical contribution is to show the existence of a decentralized currency, whose trust does not reside in a monetary authority or Central Bank, but in a Blockchain technology, which automatically records the value of transactions accurately, operated by expert individuals located on mining farms, and constitutes the most important element of structural guarantees (GE), which increases confidence in the use of bitcoin (Gefen et al., 2003).

To conclude, it is important to mention that the theory indicates that risk must be analyzed in a multidimensional way so that it provides more elements, in the case of cryptocurrencies it is not recommended, since the negative connotation is very insignificant (Featherman & Pavlou, 2003; Lee, 2009). Given that this study is cross-sectional, a longitudinal study could provide a greater scope in terms of the evolution of the factors over time, in addition to recommending studies in different regions and based on different types of cryptocurrencies in order to compare the results.

Currently, cryptocurrencies are receiving more and more attention, mainly bitcoin, which, in 2021, despite the crisis due to the pandemic, has reached all-time highs. Perhaps because bitcoin has existed since 2008, its acceptance and use have not yet been exhaustively evaluated, which is why this type of study is considered important. To this, it must be added that there is no research that analyzes the adoption of cryptocurrencies or bitcoin with second-generation statistical tests. To fill this gap and meet the objectives of this research, a model was formulated and tested which integrates multi-dimensional trust and perceived risk to measure intention to use. Statistical results indicate consistency and validity coupled with high predictive power by explaining 60.5 % of the variance of intention to use and 16.5 % of the actual use of bitcoin. Structural guarantees and familiarity are the most significant factors that explain trust and therefore the intention to use bitcoin, thereby fulfilling the objective of knowing that these elements are key to explaining the acceptance and use of bitcoin.

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