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From CFOs to Crypto: Unraveling Factors in Corporate Adoption

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Master in International Management

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Resumo

Esta dissertação tem como objetivo de estudo perceber que características são consideradas relevantes para que as empresas adotem as criptomoedas como forma de pagamento ou até mesmo como investimento.

Para que fosse possível chegar a estes resultados foi necessário recorrer a artigos académicos e livros sobre o tema criptomoedas de forma a identificar os conceitos importantes a serem abordados ao longo deste trabalho de pesquisa e que ajudaram a detetar a questão principal de estudo. Para além disso, foi necessário diferenciar moeda digital de criptomoedas, sendo que são dois sistemas financeiros distintos.

Como o objetivo de estudo é perceber que características tornam as criptomoedas e o sistema por detrás das mesmas que se designa *blockchain* mais atrativos para as empresas, que desempenham as suas funções a nível internacional, foram elaboradas questões com base na matéria abordada na revisão de literatura que clarificaram o que é mais importante para uma empresa quando se trata de entrar neste novo mundo financeiro, sendo que estas foram dirigidas a especialistas na área financeira para que os resultados do estudo sejam viáveis.

Após a análise dos artigos académicos e outros estudos relacionados com o tema foi elaborado uma questão acerca do impacto das criptomoedas nas empresas. Esta questão foi colocada a um grupo de indivíduos especializados em finanças e um método quantitativo foi utilizado de forma a conseguirmos avaliar e analisar os resultados obtidos. Este método quantitativo baseia-se numa técnica de decisão que envolve criar uma rede de causa e efeito entre as variáveis e designa-se por DEMATEL (*Decision-Making Trial and Evaluation Laboratory*). Este método de análise de resultados não só nos permitiu analisar que tipo de variáveis eram causas e efeitos, mas também foi possível avaliar o grau de importância de cada uma destas variáveis.

Os resultados obtidos espelham que as empresas necessitam que as criptomoedas desenvolvam mais o seu nível de segurança para que estas se tornem uma opção financeira para as corporativas.

Esta pesquisa classifica-se nos códigos JEL E42 (Monetary Systems, Standards, Regimes, Government and the Monetary System, Payment Systems) e F23 (Multinational Firms, International Business).

Abstract

The aim of this research is to comprehend the characteristics that companies deem relevant when considering the adoption of cryptocurrencies as a payment method or investment avenue. In order to attain these insights, an extensive analysis of academic articles and literature pertaining to cryptocurrencies was conducted to discern the pivotal concepts that would inform the development of this research. This approach served to elucidate the primary research question of the study. Moreover, it was imperative to distinguish between fiat currency and cryptocurrencies, as the latter operates within a distinct financial framework.

Given that the primary objective of this research is to ascertain the attributes that render cryptocurrencies and the underlying blockchain technology more appealing to multinational companies, a series of inquiries were formulated based on the findings of the literature review. These inquiries were directed toward financial experts to ensure the credibility and reliability of the research outcomes.

Following a theoretical examination of academic studies and literature relevant to the subject, a query regarding the impact of cryptocurrencies on companies was meticulously crafted. This inquiry was subsequently administered to a panel of financial experts, and a quantitative method known as DEMATEL was employed to assess their responses. The DEMATEL method entails a decision-making technique that facilitates the construction of a cause-and-effect network of interconnected factors, along with a determination of the relative significance of each variable.

The findings reveal that cryptocurrencies must bolster their security systems and policies to garner consideration as a viable financial option for companies.

This study classifies in the JEL codes E42 (Monetary Systems, Standards, Regimes, Government and the Monetary System, Payment Systems) and F23 (Multinational Firms, International Business).

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1. Introduction

Throughout history, people have consistently required a means of facilitating transactions for the acquisition of goods and services (DUMITRESCU, 2017). In the primitive era, various items served as representations of currency, with the earliest form of money being seashells (Davies, 2002). Subsequently, the concept of money underwent several transformations, adopting different physical embodiments that society deemed valuable at various junctures, including metals, paper, and even feathers.

With the progression of time, these payment methods evolved into more sophisticated forms to meet the demands of an advancing society. (DUMITRESCU, 2017).

Technology has consistently played a pivotal role in enhancing the quality of life (Ferreira, 2015). As a result of technological advancements and innovation, the contemporary world has transitioned into a more digitized state across all sectors, and the banking system is no exception. In this ever-evolving landscape of technology and innovation (Nguyen, 2016), alternative financial methods have emerged, one of which is cryptocurrencies. Cryptocurrencies offer a means of conducting financial transactions through digital coins that operate on a blockchain system. (Campino, et al., 2021).

The term cryptocurrency came to prominence with the advent of the most renowned digital currency, Bitcoin, in 2008. This innovative system connected individuals through a peer-to-peer infrastructure, enabling them to engage in digital coin transactions using a cryptographic framework (Scott, et al., 2021). Subsequently, a multitude of alternative cryptocurrencies, often referred to as altcoins, entered the market distinguishing themselves from Bitcoin (Chuen, et al., 2017; Li, et al., 2023).

Despite being a relatively recent phenomenon in society, there have already been numerous studies conducted on cryptocurrency technology, coin evaluation methods, and the potential risks individuals may encounter (Liu & Tsyvinski, 2021). However, after conducting a comprehensive analysis of these articles, it becomes evident that certain gaps persist in this field of study, particularly with regard to the adoption of cryptocurrencies by businesses and the subsequent outcomes of such adoption

Hence, the objective of this research is to discern the criteria that companies find significant when contemplating the adoption of cryptocurrency as a means of payment and investment, especially in light of the increasing prevalence of cryptocurrency exchanges as a capital investment avenue. To achieve this, the paper commences by establishing a clear distinction between various financial concepts, including physical and digital currency, accompanied by a concise exploration of the historical evolution of currency itself.

Secondly, it is crucial to grasp the distinction between fiat currencies and cryptocurrencies. While both are digital forms of currency, cryptocurrencies stand apart by virtue of their utilization of blockchain technology, which deviates from the conventional banking system. The development of blockchain technology was driven by the objective of instilling trust in the system (Pierro, 2017). This paper will expound upon the intricate mechanics underpinning cryptocurrencies, including the pivotal role of blockchain technology.

Subsequent to the elucidation of the core concepts within this paper, an examination ensues regarding the behavior of cryptocurrencies when embraced by companies, along with a comprehensive assessment of the primary benefits and drawbacks that may arise from such adoption. The exploration of these advantages and disadvantages assumes paramount importance in this research, as they have informed the formulation of a specific research question following the analysis of the literature review.

This research endeavors to discern the salient features offered by cryptocurrencies that hold significance for companies in their decision to adopt this form of currency. To this end, a comprehensive set of cryptocurrency attributes has been delineated based on the insights garnered from the examination of advantages and disadvantages. These attributes have, in turn, guided the formulation of structured inquiries, which were subsequently addressed by financial experts to ensure the highest level of research reliability.

Ultimately, the outcomes of this study will be subjected to analysis through the DEMATEL method, with the objective of deriving the requisite conclusions that address the research question posed in this paper.

2. Literature review

Before delving into the foundational aspects of the study concerning the influence of cryptocurrencies on corporate conduct, it is essential to provide a comprehensive understanding of some fundamental concepts. Consequently, the literature review will commence by furnishing a straightforward explanation of the distinction between physical and digital currency, subsequently extending to elucidate the disparities between cryptocurrencies and fiat currencies.

Following the comprehensive exploration of these foundational concepts, the study will then pivot its focus to Bitcoin, a pivotal subject matter, and the technology that underpins it. Equipped with a sound comprehension of these concepts and the requisite knowledge, one can discern the criteria and prerequisites essential for companies to consider the adoption of cryptocurrencies.

2.1. Physical and digital cash

2.1.1. Physical cash

In ancient times, within primitive or tribal communities, the concept of money as we currently understand it did not exist. Instead, economic transactions relied on the exchange of various goods with differing intrinsic values, such as livestock, salt, tobacco, shells, stones, furs, and leather. In essence, these items were employed as a medium of exchange, embodying a barter system for trade.

This system was characterized as a "system of reciprocal exchanges or gift-giving" (Mauss, 1925; Polanyi, 1944), wherein the arrangement involved an informal agreement to exchange goods, services, or other forms of information (Wray, 1993; Araujo, et al., 2016).

Over time, this system underwent refinement, and rather than relying on the exchange of goods and valuable materials, monetary authorities introduced the concept of standardized coins with fixed values. This transition enabled individuals to have a clearer understanding of the value of commodities and their monetary holdings. Consequently, the gold standard was introduced, signifying that gold was utilized as domestic currency, with the total number of coins in circulation equating to the country's gold reserves (Durlauf & Blume, 2010).

This system persisted for a considerable duration, yet it faced instabilities, including challenges in foreign exchange, necessitating subsequent modifications. In 1971, Richard Nixon declared the termination of the gold standard. Since that crucial moment until the present day, the currency in

circulation within the economy no longer corresponds to the gold reserves held by countries (Zeiler, 2022).

Physical cash is presently embodied by tangible objects, namely coins and bills, commonly utilized by individuals. Transactions involving physical cash do not necessitate the involvement of a third party for regulation.

One of the most prominent advantages of physical cash lies in the fact that "the possessor of the physical object inherently assumes ownership of the unit of value." Nonetheless, transactions with physical cash, as depicted in Figure 1, demand the physical presence of the individuals in the same location to facilitate the exchange. (Berentsen & Schär, 2018).

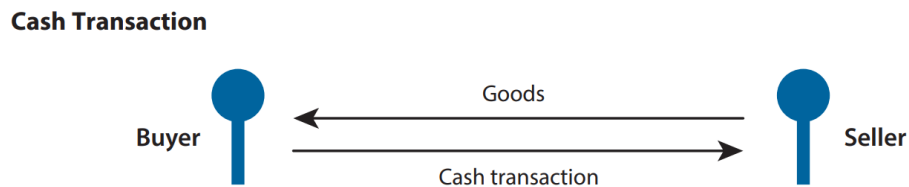


Figure 1: Physical cash transaction (Berentsen & Schär, 2018)

2.1.2. Digital cash

Money can also take on a digital form when transferred electronically. In such transactions, the physical proximity of both parties is not a requirement, as money can seamlessly flow through electronic networks. However, this digital mode of exchange is contingent upon a centralized system, rendering it susceptible to potential risks like hacking, technical malfunctions, and unwarranted government interventions.

This system is emblematic of a scenario where a central authority assumes the responsibility of validating the legitimacy of all financial transactions and meticulously tracking them, as delineated in Figure 2 (Berentsen & Schär, 2018).

Payment System with a Central Authority

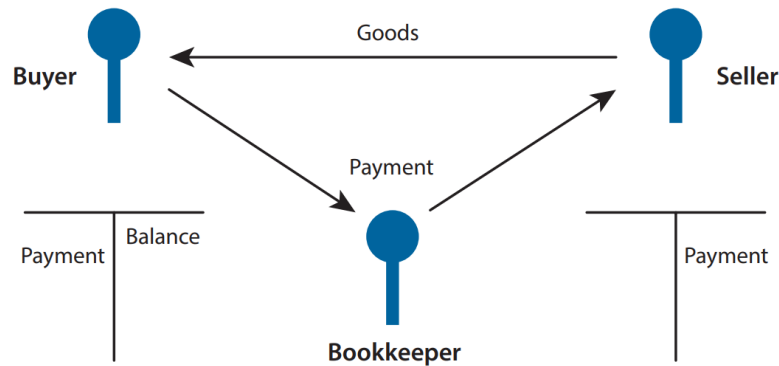


Figure 2: Payment system with central authority (Berentsen & Schär, 2018)

2.2. Fiat Currencies and cryptocurrencies

2.2.1. Fiat currencies

Fiat currencies, also referred to as government-issued monopoly currencies, exemplified by currencies like the Swiss franc, euro, and U.S. dollar, are brought into existence by the government (Berentsen & Schär, 2018). The value of a fiat currency is contingent upon the dynamics of supply and demand. Notably, a fiat currency's worth is upheld by the government, and it is not backed by physical reserves such as gold, silver, or stockpiles. Consequently, fiat currencies perpetually face the risk of devaluation owing to factors like inflation or hyperinflation (Chen, 2020). However, it's imperative to acknowledge that while fiat currencies are upheld by their respective governments, the exchange rates between these currencies fluctuate when dealing with diverse currencies (Cachanosky, 2012).

Certain theories, such as monetary theory, postulate that fiat currencies are likely to maintain their dominance, potentially posing challenges for cryptocurrencies. This is because cryptocurrencies may not be able to compete effectively with a well-established fiat currency, but their competitive advantage might be more pronounced when pitted against a fiat currency characterized by high inflation rates (Kirkby, 2018).

2.2.2. Cryptocurrency

Cryptocurrency is a digital peer-to-peer exchange system that (Mukhopadhyay, et al., 2016) operates by generating and distributing currency units. Diverging from fiat currencies, cryptocurrency is a digital asset devoid of physical representation, founded on crypto-technology, and designed to facilitate transactional processes and the generation of additional monetary units.

This form of currency serves two primary functions: mining and exchange. The first function involves the production of cryptocurrencies utilizing advanced technology, while the second function pertains to the transactions conducted within the cryptocurrency market.

While there is a proliferation of cryptocurrencies in the contemporary landscape, including Ethereum, Dogecoin, and Cardano (ADA), it is Bitcoin (BTC) that retains its status as the most renowned (Chohan, 2022). These digital currencies can also serve as assets in portfolio management, contributing to diversification and strategic allocation of funds to optimize risk management.

Nevertheless, it's essential to acknowledge that cryptocurrencies can exert a significant impact on a portfolio due to their inherent value fluctuations. Therefore, integrating these assets into an investment portfolio necessitates a distinct management approach that takes into account the volatility associated with cryptocurrencies. (Chauhan & Arora, 2019).

In contrast to conventional transactions, cryptocurrency transactions are openly accessible for anyone to scrutinize, and they do not necessitate the involvement of a centralized authority, such as a bank, to facilitate the transactions. (Motamed & Bahrak, 2019).

2.3.Bitcoin

Bitcoin was created by Nakamoto with the purpose of being the first decentralized payment system (John, et al., 2022).

As mentioned earlier, Bitcoin (BTC) operates on a cryptographic technology known as blockchain, resulting in the absence of a central authority responsible for overseeing transactions in the cryptocurrency market.

Blockchain technology essentially constitutes a data file that comprehensively records all BTC transactions, including mining activities. For this system to function effectively, it is imperative to establish the total number of units in circulation, accounting for the units created through the mining process (Berentsen & Schär, 2018). The blockchain is essentially a distributed database, often referred to as a ledger, comprising interconnected blocks of data. New data is added with each transaction or event. To safeguard the data and ensure its integrity, "each block in the blockchain contains the hash of the previous block," as depicted in Figure 3, illustrating the structure and flow of this technology.

This innovative technology is decentralized, signifying that it operates as a liberated, self-governing system devoid of the need for central authorities or intermediaries. It holds immense promise as it not only safeguards recorded data but also diminishes operational expenses, ensures transaction transparency, and mitigates the risk of corruption (Sanka, et al., 2021).

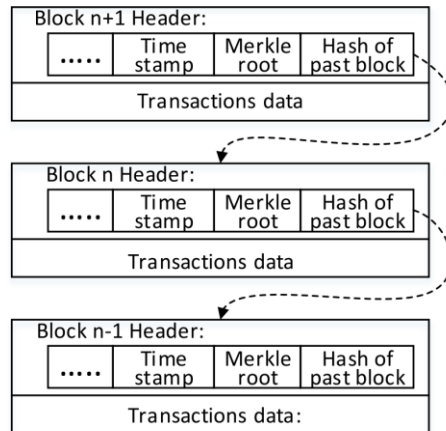


Figure 3: Blockchain Structure (Sanka, et al., 2021)

Now that we have a grasp of what cryptocurrency is and the workings of the blockchain process, we are better equipped to comprehend how cryptocurrency transactions are executed within this innovative system. The process commences with a transaction request, which triggers the creation of a new block containing that transaction. This block is subsequently transmitted to all nodes on the network. The nodes undertake the verification of the transaction, culminating in the creation of a new block that amalgamates multiple transactions. This new block is then appended to the existing chain of blocks, as depicted in Figure 4 (Milutinović, 2018).

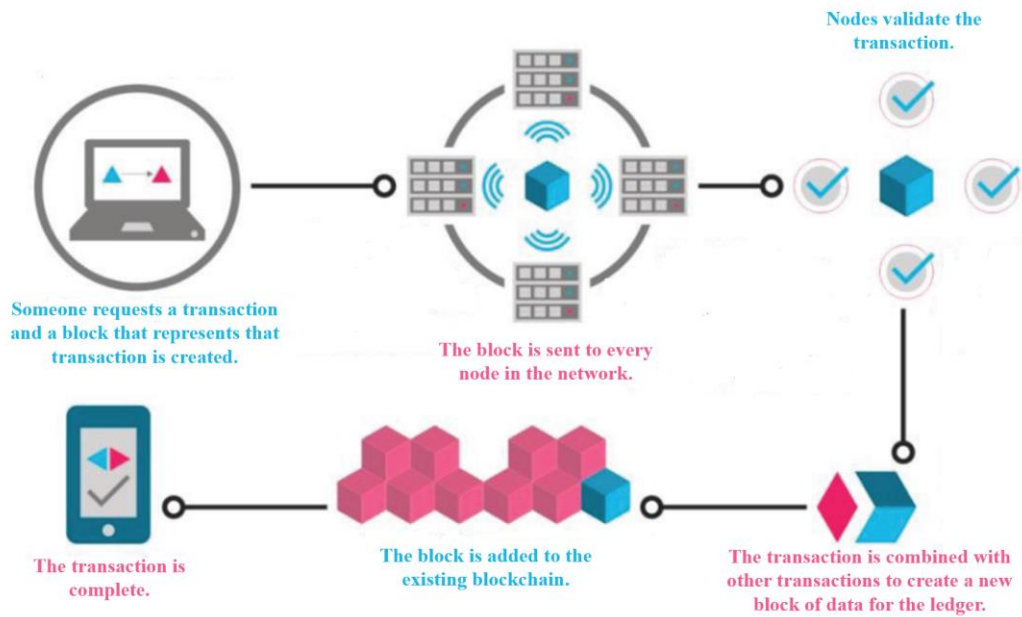


Figure 4: Cryptocurrency Transactions (Milutinović, 2018)

In the context of this study, it is also valuable to ascertain the market capitalization of Bitcoin (BTC) and identify the platforms that are predominantly favored by consumers for their transactions. Notably, we can observe in Figure 5 that the market capitalization of BTC exhibited exponential growth from 2013 to 2021. Additionally, in Figure 6, we can discern that Binance emerges as the market leader among the most commonly used platforms in 2021.

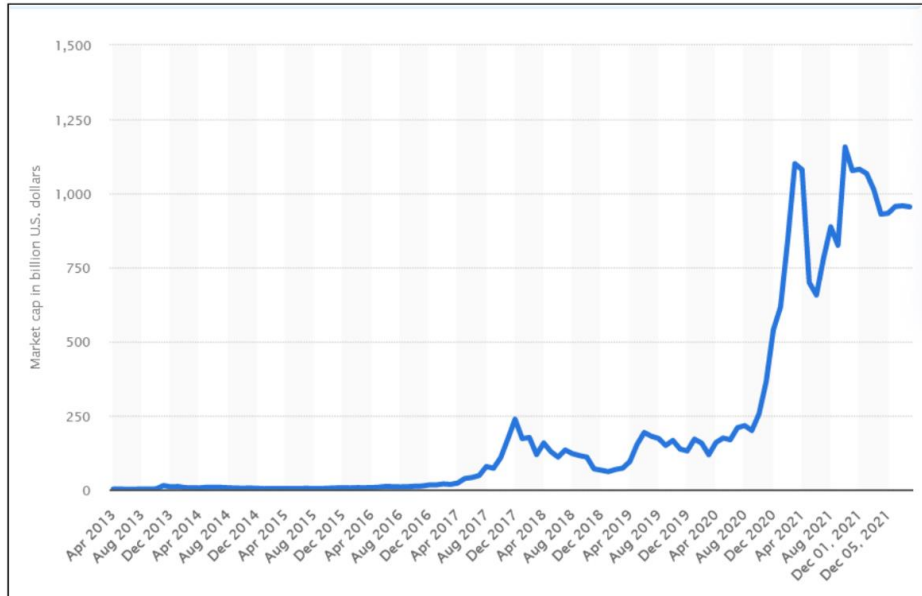


Figure 5: BTC capitalization from 2013 to 2021 (Chohan, 2022)

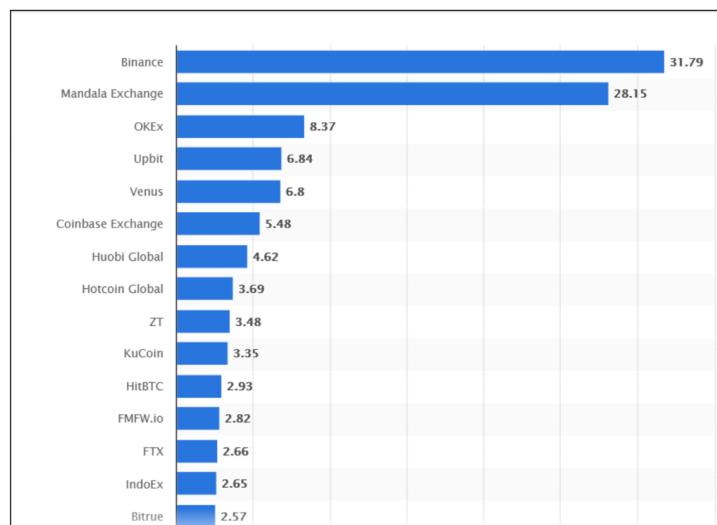


Figure 6: Cryptocurrency platforms (Chohan, 2022)

The subsequent chart, which was crafted based on the coin values on January 1st of each year, serves to illustrate the volatility of both Bitcoin and the U.S. dollar, shedding light on the distinction between the stability of a cryptocurrency and a fiat currency. Evidently, the chart reveals that Bitcoin exhibits a highly volatile and exponential pattern, characterized by significant fluctuations in both upward and downward directions. In stark contrast, the U.S. dollar is

depicted as a remarkably stable currency, devoid of the pronounced fluctuations observed in Bitcoin.

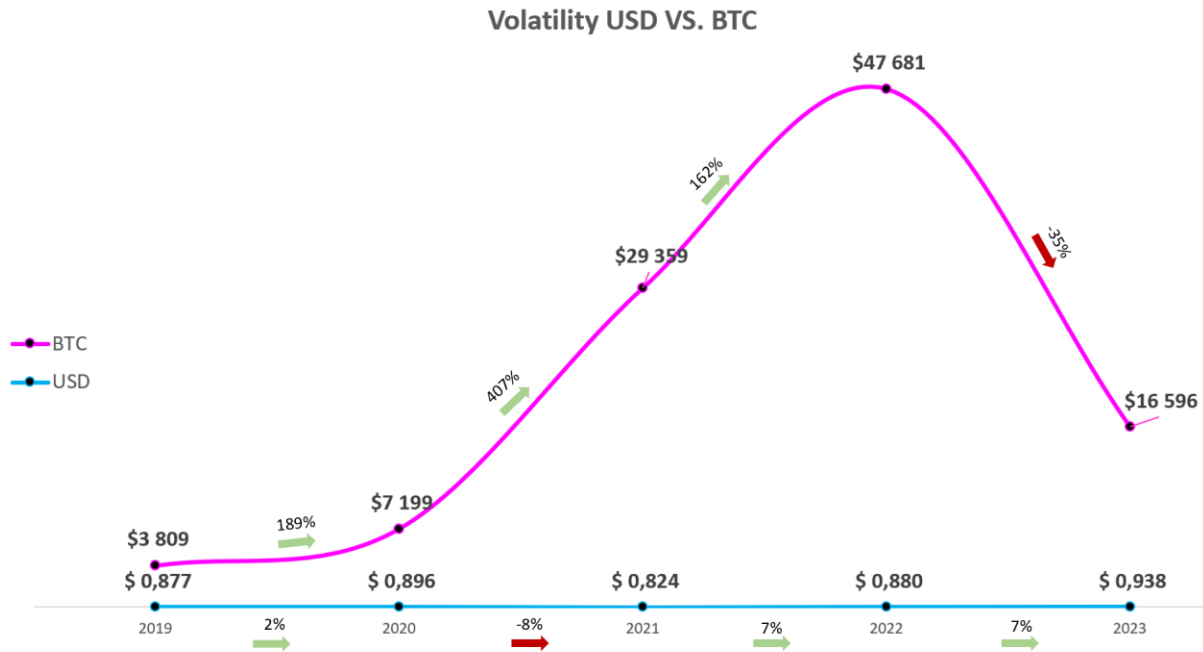


Figure 7: Capitalization of USD vs. BTC

2.4. Cryptocurrencies in businesses

The subject of cryptocurrencies stands as one of the foremost topics within the financial industry and society at large. Hence, it is of paramount significance to comprehend how the adoption of cryptocurrencies can impact businesses, encompassing a thorough examination of both the advantages and disadvantages associated with their utilization.

2.4.1. Advantages

Using of cryptocurrencies can be beneficial for many reasons:

- **Transparency:** The system employed in cryptocurrencies is engineered to enable real-time visibility into all transactions. Consequently, this feature affords the ability to obtain a comprehensive overview of the payment system and the individuals engaged in these transactions. (Bunjaku, et al., 2017).

- **Anonymity and confidentiality:** In addition to the advantages of transparency, this system also provides individuals with a degree of anonymity. Whether it's an individual or a company utilizing the system, there is no requirement to furnish personal information such as names, addresses, and other identifying data (Bunjaku, et al., 2017; Andraschko & Britzelmaier, 2020).
- **Security:** Given that there's no necessity to disclose user information, and the required data remains confidential, this system acts as a safeguard against potential fraud and theft. (Bunjaku, et al., 2017; Andraschko & Britzelmaier, 2020).
- **Agile:** The system facilitates easy and cost-effective transactions between two parties, featuring nominal transaction fees compared to those typically imposed by traditional banks. This affordability is one of the primary factors driving the acceptance of Bitcoin as a valid form of currency in certain countries (Bunjaku, et al., 2017; Andraschko & Britzelmaier, 2020).
- **Unlimited transactions:** Any user can initiate transactions to recipients of their choice, without being constrained by geographic restrictions, and with full control over the desired transaction amount, all while evading hindrances or controls (Bunjaku, et al., 2017).
- **Transaction speed:** Regardless of users' geographical location or the magnitude of the funds they intend to transfer, the system is meticulously designed to furnish all users with expedited transaction processing, ensuring swift and efficient operations (Bunjaku, et al., 2017; Andraschko & Britzelmaier, 2020).

2.4.2. Disadvantages

Despite the appealing advantages that cryptocurrencies can offer to individuals and businesses, it is discernible that this system is not without its associated disadvantages, which warrant consideration and potential mitigation:

- **Volatility:** A prevalent argument often raised in discussions about cryptocurrencies pertains to their susceptibility to government regulations and media pronouncements, which can exert a substantial impact on their volatility. Consequently, the value of the cryptocurrency at the time of transfer may differ from the amount received by the recipient, either

increasing or decreasing, contingent upon the prevailing market value of the coin (Dierksmeier & Seele, 2016; Bunjaku, et al., 2017); Andraschko & Britzelmaier, 2020).

- Lack of regulation: In the absence of robust regulations, cryptocurrencies can potentially be exploited for illicit purposes, including money laundering and the financing of unlawful activities (Dierksmeier & Seele, 2016; Bunjaku, et al., 2017); Andraschko & Britzelmaier, 2020).
- Non-governmental support: Many governments perceive cryptocurrencies and their underlying systems as potential challenges to the conventional monetary framework. Consequently, they are contemplating the implementation of taxation and other regulatory measures specific to cryptocurrencies (Dierksmeier & Seele, 2016).
- Hacking: Similar to the vulnerabilities experienced in the traditional banking system, cryptocurrencies are also susceptible to cyberattacks, where hackers may breach users' wallets or cryptocurrency exchange platforms, such as crypto.com, potentially resulting in the theft of users' cryptocurrency holdings (Dierksmeier & Seele, 2016).

In figure 8 is a short summary of the advantages and disadvantages found:

Advantages	Disadvantages
<ul style="list-style-type: none">• Anonymity;• Transparency;• Security;• Agile;• No Inflation;• Unlimited;• Transactions;• Transaction Speed.	<ul style="list-style-type: none">• Volatility;• Lack of Regulation;• Non-governmental Support;• Hacking.

Figure 8: Cryptocurrency advantages and disadvantages

The provided information indeed contributes to a more comprehensive understanding of the prospective adoption of cryptocurrencies by businesses. While the advantages of such adoption are evident, it is equally apparent that lingering questions and concerns persist, casting uncertainty and apprehension regarding the implications and repercussions associated with the current integration of cryptocurrencies into business operations. The future of cryptocurrency adoption remains an

evolving and complex landscape that necessitates careful consideration of the potential benefits and challenges that lie ahead. (Chohan, 2022).

2.5.Literature gap

Despite the increasing volume of literature on cryptocurrencies in recent years, there remain notable gaps in our understanding of this rapidly evolving field. The previous chapter provides a foundational understanding of key cryptocurrency concepts, including the underlying technology, distinctions between fiat and cryptocurrencies, and the associated advantages and disadvantages that are crucial for businesses, investors, and users to consider within this novel financial system. However, the dearth of research on the influence of cryptocurrencies on companies highlights the need to address these knowledge gaps, which is the primary objective of this thesis.

Given the growing acceptance of cryptocurrencies by companies like Microsoft, Tesla, and Amazon as a viable means of payment, a pressing question arises: What specific characteristics should Bitcoin and other alternative coins possess to make them attractive to the majority of global companies, both as a mode of payment and as an investment vehicle? If people increasingly shift towards using digital currencies instead of traditional payment methods such as credit/debit cards and PayPal, companies will face the necessity of adapting to this new and inherently volatile financial market. Consequently, it is imperative to discern which attributes hold the utmost significance for companies in a financial system to ascertain whether cryptocurrencies align with their requirements.

3. Methodology

In this chapter, the research methodology and its development will be elucidated. A clear explanation will be provided regarding the method employed to formulate the necessary questions that underpin the research problem. This encompasses the entire process of defining variables and conducting the analysis. Furthermore, the rationale for selecting these specific research tools will be expounded upon and justified.

3.1. Research method

This research is using a quantitative method to analyze the financial experts' opinions on the needs to adopt cryptocurrencies in their companies. We have followed the approach used by Shieh et al., 2010 for the application of a Decision-Making Trial and Evaluation Laboratory (DEMATEL) method. DEMATEL is a multi-criteria decision-making technique that involves creating a cause-and-effect network of interrelated factors and analyzing the relationships among them to determine their relative importance. It is used to identify and prioritize the factors that affect a decision or problem, and to determine the causal relationships among these factors. The DEMATEL process begins with the identification of the problem or decision to be made and defining the factors that contribute to it, in our case, the adoption of cryptocurrencies by companies and the factors that contribute to this adoption. These factors are then grouped into categories and a matrix is created to show the relationships between the factors. This matrix is then transformed into a digraph or network diagram that shows the causal relationships between the factors. Next, the digraph is analyzed to determine the relative importance of each factor and to identify the key drivers of the problem. The results are then used to develop a strategy or action plan to address the problem or make the decision.

In our research, we have decided to use the opinion of finance experts to develop our DEMATEL analysis. Therefore, we first selected, based on the literature, the most important categories which influence the adoption of cryptocurrencies by companies. Then, the matrices were produced, and the data was analyzed. According to Shieh et al., 2010, there are four main steps to conduct a correct DEMATEL analysis. We followed the approach proposed and previously tested which is summarized in table 1.

Step	Description	Method
1	Calculate the average matrix which is based on the experts' opinions (0-3) about the influence of each category on the other.	$A = a_{ij} = \frac{1}{H} \sum_{k=1}^H x_{ij}^k$
2	Calculate the normalized initial direct-relation matrix by normalizing each coordinate of the average matrix by the maximum value of the average matrix.	$S = \frac{1}{\max_{1 \leq i \leq n} \sum_{j=1}^n a_{ij}}$
3	Calculate the total relation matrix. From this matrix is possible to derive the total effects given and received by each factor as $(r_i + c_j)$ indicating their importance. Furthermore, we can calculate the net effect of each factor to the system as causes and effects identified in the research as $(r_i + c_j)$.	$T = D(I - D)^{-1}$
4	Define the threshold value to build the final diagram. As T matrix provides information on the interactions among effects we can disregard from our final analysis negligible effects. The threshold is defined by averaging the T matrix and the diagram obtained by $(r_i + c_j, r_i - c_j)$.	\bar{T}

Notation: i and j are factors; k is the number of respondents; H is each respondent; x_{ij} is the degree to which the respondent believes factor i affects factor j ; D is the normalized matrix; I is the identity matrix; c is the sum of columns; r is the sum of rows.

Table 1: Methodology approach

3.2. Categories identification

Drawing from the insights gained through the literature review, a set of critical variables pertinent to this research has been identified and is outlined in Table 2. Subsequently, a panel of experts was meticulously chosen to solicit their expert opinions and input on these variable categories.

ID	Category
A	The safety of doing transactions and having money in cryptocurrencies platforms
B	A completely transparent system where every information is shared
C	Speed of transactions
D	Make transactions to anywhere in the world with no complications and low fees
E	Have the possibility to pay to your customers or suppliers with cryptocurrencies
F	Offer more payment methods than the traditional ones to your clients and suppliers
G	Ease integration with existing systems
H	Increase liquidity of cryptocurrencies market
I	Potential cost savings and efficiencies
J	Investment opportunities from acquiring cryptocurrencies

Table 2: Variables

3.3. Data collection and analysis

Numerous experts were approached for this study, given their prominent leadership roles within their respective organizations. Ultimately, interviews were conducted with three experts who occupy influential managerial positions in the realm of finance. Their extensive knowledge of the subject matter and the corporate landscape render their insights particularly valuable. To maintain confidentiality and privacy, the identities of these experts will be kept anonymous throughout this study, with a summary of their characteristics provided in Table 3.

ID	Gender	Age	Position	Sector
1	Male	40-50	Chief Financial Officer	Water
2	Male	50-60	Chief Financial Officer	Industrial
3	Male	20-30	Chief Financial Officer	Construction

Table 3: Sample characteristics

The experts were all contacted, and the research methodology was comprehensively explained to them. Upon their agreement with the proposed methods, a questionnaire (Figure 9) was subsequently distributed via email, accompanied by detailed instructions. The questionnaire required the experts to assess the impact of each variable category on one another, utilizing a scale ranging from 0 to 3, where 0 signifies no impact, and 3 signifies a substantial impact.

Category	Description
A	The safety of doing transactions and having money in cryptocurrencies platforms
B	A completely transparent system where every information is shared
C	Speed of transactions
D	Make corporative transactions to anywhere in the world with no complications and low fees
E	Have the possibility to pay to your customers or suppliers with cryptocurrencies
F	Offer more payment methods than the traditional ones to your clients and suppliers
G	Ease integration with existing systems
H	Increase liquidity of cryptocurrencies market
I	Potential cost savings and efficiencies
J	Investment opportunities from acquiring cryptocurrencies

Question: On a scale of 0 to 3 (where 0 stands for no impact and 3 stands for a huge impact), please evaluate the impact that you think each category has on each other.

	A	B	C	D	E	F	G	H	I	J
A										
B										
C										
D										
E										
F										
G										
H										
I										
J										

Figure 9: Survey question

The responses provided by each respondent were collected and returned to the authors for analysis, adhering to the established research methods. To facilitate the process for the respondents, the questions were distributed in a Microsoft Excel format, designed to resemble a matrix as depicted in Figure 9. Subsequently, the data underwent the necessary treatment and analysis, conducted employing the same software, in addition to the utilization of R-Studio for matrix operations and graph generation.

4. Results

In this section of the paper, we will delve into a discussion of the results obtained through the questionnaire presented in the methodology. To facilitate a clearer and more concise presentation of the results, we will employ the abbreviations outlined in Table 4 to reference the criteria under consideration.

Abbreviations	Criteria
A	Safety of doing transactions and having money in cryptocurrencies platforms
B	Completely transparent system where every information is shared
C	Speed of transactions
D	Make corporate transactions without geographic boundaries and without fees
E	Possibility of paying to customers and suppliers with cryptocurrencies
F	Offer more payment methods than the traditional ones to customers and suppliers
G	Easy integration with existing systems
H	Increase liquidity of cryptocurrencies market
I	Potential cost savings and efficiencies
J	Investment opportunities from acquiring cryptocurrencies

Table 4: Criteria

To initiate the DEMATEL method, as elucidated in the methodology, the first step involved generating a Total Relationship Matrix (T), which is presented in Table 5. This matrix ascribes normalized weights to the interactions between criteria and subsequently calculates the sum of weights per criterion, denoted as R_i and C_i , respectively, both in terms of rows and columns.

	A	B	C	D	E	F	G	H	I	J	R_i
A	0,669	0,710	0,725	0,726	0,630	0,614	0,654	0,641	0,678	0,592	6,640
B	0,708	0,564	0,646	0,661	0,555	0,556	0,594	0,609	0,629	0,579	6,101
C	0,816	0,760	0,652	0,763	0,676	0,630	0,673	0,704	0,712	0,654	7,039
D	0,823	0,739	0,755	0,647	0,685	0,624	0,667	0,683	0,706	0,632	6,959
E	0,725	0,660	0,676	0,677	0,518	0,555	0,623	0,623	0,644	0,562	6,263
F	0,720	0,670	0,657	0,658	0,594	0,486	0,605	0,634	0,640	0,559	6,223
G	0,770	0,690	0,678	0,678	0,612	0,584	0,544	0,668	0,645	0,577	6,447
H	0,626	0,581	0,596	0,582	0,541	0,515	0,565	0,485	0,554	0,537	5,581
I	0,809	0,753	0,755	0,756	0,670	0,624	0,667	0,683	0,611	0,633	6,962
J	0,618	0,575	0,577	0,577	0,508	0,469	0,517	0,560	0,535	0,426	5,360
C_i	7,283	6,702	6,719	6,726	5,988	5,656	6,108	6,289	6,353	5,751	

Table 5: Total Relationship Matrix (T)

The summation and subtraction of the R_i and C_i values provides us with insights into the significance of the criteria (r_i+c_i) and whether they function as effects or causes (r_i-c_i). Effects are essentially dependent variables that are influenced by the causes and are regarded as the outcomes

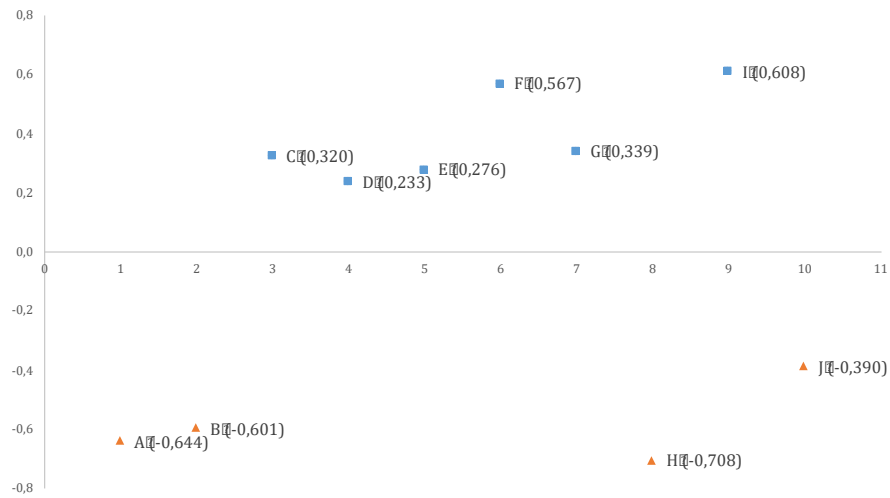
of decisions. On the other hand, causes are considered independent variables that exert an impact on the issue or decision. Table 6 portrays these values for a more comprehensive understanding of their roles and relationships.

Criteria	Ri	Ci	Ri+Ci	Ri-Ci	Identity
A	6,640	7,283	13,923	-0,644	Effect
B	6,101	6,702	12,803	-0,601	Effect
C	7,039	6,719	13,758	0,320	Cause
D	6,959	6,726	13,685	0,233	Cause
E	6,263	5,988	12,251	0,276	Cause
F	6,223	5,656	11,878	0,567	Cause
G	6,447	6,108	12,554	0,339	Cause
H	5,581	6,289	11,870	-0,708	Effect
I	6,962	6,353	13,315	0,608	Cause
J	5,360	5,751	11,111	-0,390	Effect

Table 6: Causes and Effects

With a focus on the significance of each criterion, it becomes evident that criterion A (safety of conducting transactions and holding funds on cryptocurrency platforms) stands out as the most vital aspect for our financial experts. It is followed by criteria C (speed of transactions), D (ability to execute transactions worldwide with ease and low fees), and I (potential cost savings and efficiencies). On the other hand, criteria J (investment opportunities from acquiring cryptocurrencies) is regarded as the least important, along with criteria H (increasing liquidity in the cryptocurrency market) and F (offering more payment methods than traditional options to clients and suppliers).

The tables provide a clear interpretation of the results obtained, but for a more vivid representation of the criteria distribution and the distinction between causes and effects, Graphic 1 offers a visual depiction of the findings.



Graph 1: Causes and Effects

From the Total Matrix Table, a Relationship Matrix (R) was extracted, which is presented in Table 7. This matrix delineates the existing relationships between the criteria. It was created by eliminating all values lower than the average R^- and retaining only values equal to or greater than this average. This process was executed to exclusively analyze the pertinent relationships.

Furthermore, we identify an average of 4,7 relations, a maximum of 8 and a minimum of 0 relations per criteria and the relationships: (A) -> B, C, D, G, H, I; (B) -> A, C, D; (C) -> A, B, D, E, G, H, I, J; (D) -> A, B, C, E, G, H, I; (E) -> A, B, C, D, I; (F) -> A, B, C, D, I; (G) -> A, B, C, D, H, I; (I) -> A, B, C, D, E, G, H.

	A	B	C	D	E	F	G	H	I	J
A		0,710	0,725	0,726			0,654	0,641	0,678	
B	0,708		0,646	0,661						
C	0,816	0,760		0,763	0,676		0,673	0,704	0,712	0,654
D	0,823	0,739	0,755		0,685		0,667	0,683	0,706	
E	0,725	0,660	0,676	0,677					0,644	
F	0,720	0,670	0,657	0,658					0,640	
G	0,770	0,690	0,678	0,678				0,668	0,645	
H										
I	0,809	0,753	0,755	0,756	0,670		0,667	0,683		
J										

Table 7: Relationship Matrix

As discernible from the table, criterion C exhibits the broadest array of relationships, having connections with all criteria except for criterion F, which lacks any connections to other criteria. Conversely, criterion B establishes a more limited number of relationships, with connections to only three other criteria. This information underscores the varying degrees of interconnectedness between the criteria under consideration.

While it is crucial to ascertain the relationships between each criterion, understanding the strength of these relationships is equally significant. To facilitate this, defined thresholds have been established to categorize the relationships as weak, medium, or strong, enhancing the depth of insight into the connections between the criteria. To develop this matrix of strength (S) we defined the values between the minimum of R ($\min(R)$) and the mean of R ($\text{mean}(R)$) as weak, the values between the $\text{mean}(R)$ and the third quartile ($\frac{\max(R)+\text{mean}(R)}{2}$) were consider as medium and, finally, the values between $\frac{\max(R)+\text{mean}(R)}{2}$ and the maximum of R ($\max(R)$) we consider as strong.

It is possible to analyze by table 8 that the strength relationship is variable depending on the criteria. The strongest relationships are (C) \rightarrow A, D; (D) \rightarrow A; (G) \rightarrow A; (I) \rightarrow A and it is possible to verify that several criteria have a strong impact in criteria A.

	A	B	C	D	E	F	G	H	I	J
A		Medium	Medium	Medium			Weak	Weak	Weak	
B	Medium		Weak	Weak						
C	Strong	Medium		Strong	Weak		Weak	Medium	Medium	Weak
D	Strong	Medium	Medium		Weak		Weak	Weak	Medium	
E	Medium	Weak	Weak	Weak					Weak	
F	Medium	Weak	Weak	Weak					Weak	
G	Strong	Weak	Weak	Weak				Weak	Weak	
H										
I	Strong	Medium	Medium	Medium	Weak		Weak	Weak		
J										

Table 8: Relationship strength matrix

In this table it is also possible to verify that criteria H doesn't establish a relationship with any other criteria and criteria B is the one that establish a smaller number of relationships possible. Furthermore, only criteria C establishes a relationship with criteria J and it is a weak relationship.

4.1. Discussion

The results of the study offer valuable conclusions about the factors influencing financial experts in the context of cryptocurrency adoption by companies. Firstly, the study reveals that the most crucial criteria for these experts are related to internal aspects of the company, such as the safety of conducting transactions with cryptocurrencies and having funds on crypto platforms, transaction speed, and the ability to conduct transactions globally with ease and low fees, and the potential for cost savings and efficiencies. The emphasis on security stems from the absence of regulatory oversight in the cryptocurrency market, while convenience and efficiency are also highly prized.

Conversely, the criteria associated with external aspects of the company, such as investment opportunities and the broader cryptocurrency market, are deemed less important. Notably, offering a new payment method to clients and suppliers as an alternative to traditional methods is considered the least important aspect by the experts, and this criterion is independent, with no relationships with other criteria.

Among the relationships identified, it is noteworthy that criteria A, which is the most important for the experts, has strong relationships with criteria C, D, G, and I. These criteria are all related to the internal financial operations of the company and financial matters, which explains their strong

connection with the safety criterion. Criteria H, focused on increasing liquidity in the cryptocurrency market, does not establish any relationships with other criteria, as it is an external criterion not influenced by other aspects.

Lastly, criteria B, transparency of the cryptocurrency system where all information is shared, forms two weak relationships. These relationships suggest that transparency may have some influence on transaction speed and safety. It is also interesting to note that only transaction speed is linked to investment opportunities, albeit weakly.

In conclusion, the study underscores the paramount importance of investing in the safety of transaction systems and providing guarantees to users in order to instill confidence among financial experts and encourage corporate adoption of the cryptocurrency market. Building trust and ensuring the security of financial transactions are essential for cryptocurrency markets to gain the trust of financial experts and stimulate interest in corporate adoption.

5. Conclusion

The study highlights that while the cryptocurrency system offers attractive features for companies, such as fast and low-cost money transfer capabilities, these attributes alone are not sufficient to win the confidence of financial experts and companies. Security is a paramount concern for corporations when considering cryptocurrency adoption. The existing blockchain technology may not be perceived as sufficiently secure by companies to risk their capital.

Additionally, the study reveals that individuals and financial experts are not particularly interested in features that provide clients with new payment options or investment opportunities in the cryptocurrency market. These aspects are perceived as less relevant because they are not directly linked to internal corporate operations.

It is conceivable that companies may only fully embrace this method of payment and investment when it becomes more regulated and ensures the security of corporate assets and data. Enhanced regulation could serve as a catalyst for increased corporate adoption by instilling confidence in the cryptocurrency market.

5.1.Theoretical and practical implications

This research holds both theoretical and practical implications for the subject of cryptocurrency adoption. Theoretical implications stem from the relevance of the topic in contemporary society, as the cryptocurrency market continues to evolve, and a deeper understanding of the subject reveals its multifaceted implications.

Practically, the study reveals that financial experts prioritize the security of a company's funds above all else, which poses a significant challenge for the adoption of cryptocurrencies by companies. The absence of regulatory oversight in the cryptocurrency market, coupled with the potential for security breaches and hacking, can deter companies from embracing this digital currency. In the event of a financial mishap, the irreversible nature of cryptocurrency transactions means that the responsibility lies with the company. This practical implication underscores the critical need for enhancing security measures and regulations in the cryptocurrency market to instill confidence among potential corporate users.

Furthermore, the research aids regulators in understanding the critical factors that companies consider when contemplating cryptocurrency adoption. This understanding is pivotal in a rapidly evolving financial landscape, allowing regulators to better address a subject of paramount importance in today's financial market.

Ultimately, the findings of this study have implications for the advantages and disadvantages discussed in the literature review, shedding light on the priorities and concerns of financial experts, which may inform future developments and regulatory decisions in the cryptocurrency market.

5.2.Limitations

This research, like any other, comes with certain limitations that should be considered when interpreting the results.

Small sample size: the study relies on the insights of a limited sample of financial experts, with only three participants. While these experts hold high financial positions, the small sample size restricts the generalizability of the findings to a broader population. The views and priorities of other experts may not be fully represented in the study. Dependency on literature review: the criteria used in the study were derived from the literature review. While the criteria provided a foundation for the study, there may be other relevant factors not considered in this research. The conclusions may be limited by the criteria used, and additional factors could contribute to a more comprehensive understanding. Potential biases: the financial experts' opinions may be influenced by personal biases or preconceived notions about cryptocurrencies. These biases could impact their responses and, consequently, the study's conclusions. Limited temporal perspective: the study captures the opinions of the CFOs at a specific point in time. If their perspectives or attitudes towards cryptocurrencies change in the future, the study will not reflect these potential shifts.

Therefore, the conclusions may not remain relevant or applicable over time. It's important to recognize these limitations when interpreting the results of the study and to consider them when applying the findings to real-world scenarios or decision-making processes.

5.3.Recommendations

To improve this work, it is recommended to find a bigger sample with financial experts in different positions because it is important to also understand if there is a connection of the mindset established in higher positions and lower positions. In this way, the study would be more complete, and it would be possible to also study if there is any relation between the job and the market view.

Also, it would improve the study if the sample included people from different cultures to understand if there is a pattern between the answers and the countries. Besides that, it is also important to have a different market view of other countries.

These improvements can lead to more complete findings that would enable researchers, cryptocurrency companies, financial experts, and others to make more informed decisions and strategies.

Finally, we would recommend that the methodology was applied to a case study of a company that already adopted cryptocurrencies as a way of payment or investment.

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