University of Sopron - Alexandre Lamfalussy Faculty of Economics

Cryptocurrencies on the Rise – the Impact of Cryptocurrencies on the Society of the Future.

Thesis Booklet

Compendium of the Dissertation

Markus Schindler

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Doctoral School: István Széchenyi Doctoral School of Management and Organizational Sciences

Head of Doctoral School: Prof. Dr. Csilla Obádovics

Program: Business Economics and Management

Doctoral Supervisors: Tit. Univ.-Prof. MMag. DDr. Dr.habil. Bernhard F. Seyr
Tamás Kovács, PhD

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Table of Contents

1. Introduction

Cryptocurrencies are digital assets created as an exchange medium using cryptographical algorithms to confirm and secure transactions. Cryptocurrencies usually use a distributed decentralized ledger to store the transaction history. There is no such thing as a central institution in control of the certain currency, it is the community, in most cases the so called “miners” who are in charge of storing this decentralized information based on blockchain technology and processing the transactions.

Blockchain technology in simple terms means a concatenation of blocks of information – transactions in the case of cryptocurrencies – with certain hashing algorithms using the hash values of previous blocks in the following ones. A copy of the whole blockchain is stored on each participant’s computer and in case that any blockchain copy gets manipulated, for example by changing the transactions data, the other participants will notice this manipulation and overwrite the fault information. Blockchain technology is claimed to be a very secure technology for storing information.

In 2009, Bitcoin was the first blockchain based cryptocurrency created by the group or individual known as Satoshi Nakamoto. Now, almost a decade later, Bitcoin’s value increased enormously and got the attention of the media as well as governments.

So far, cryptocurrencies have not found their way in society’s everyday life. A lack of acceptance in the retail business and its fluctuation are two of the main factors making cryptocurrencies difficult to use in daily business activities compared to fiat money with a very stable value and widely spread acceptance. Nevertheless, at least Bitcoin has found its way into some online shops and the trend shows that more and more shops are willing to think about implementing this new technology.

Various literature on the topic of cryptocurrencies can be found in academic literature addressing the potentials or dangers of cryptocurrencies and investing in them. Most of these papers have a focus on the technical aspects of cryptography and the design of currency blockchains.

At the moment, it is very uncertain if cryptocurrencies will find their way in our daily transaction activities although there are some countries that have recognized at least Bitcoin as a standard currency within their area of influence.

This research aims to find out if cryptocurrencies can find use cases in our future society and economy besides being a highly speculative investment strategy.

2. Overview of the Research Problem & Research Question

People have been bartering since the beginning of human history. In doing so, they are exchanging things with a similarly large intrinsic value. But simple exchange systems between two people can reach their limits relatively quickly. If both parties need the goods the other one is offering, a trade is concluded. However, if the needs do not match, this can lead to problems. This is why we need money. In the course of human history, the complexity and role of money has changed and developed again and again.

The value of the most popular and most used currencies depends on people's trust. The people trust the governments. Governments mandate central banks to print money and this is how currencies come into circulation. While the trust in fiat currencies is ensured by the amount of money spent by a central authority, the trust in cryptocurrencies is based on the underlying technology - the blockchain.

Paying for goods and services with a fiat currency means trusting central authorities such as the European Central Bank (ECB) or governments, as they act as intermediaries for the value of the fiat currency used.

Cryptocurrencies are digital assets that can be used as a medium of exchange between two parties. They enable direct transactions between individuals without the intervention of an intermediary like a bank. While fiat money is subject to inflation and central banks can print more at any time, the leading cryptocurrency Bitcoin only has a maximum of 21 million units.

With the introduction of Bitcoin, the idea to revolutionize the global monetary system was created. Cryptocurrencies are transparent, based on mathematical formulas and its success and value are based on the consensus of the users. How Bitcoin will change our view of currencies in the 21st century remains to be seen.

This study deals with the question of how and in what form cryptocurrencies will find their way into our everyday lives. Three relevant perspectives were examined with different methodological approaches.

In a large-scale survey with the Austrian working-age population as the statistical population, the attitude, experience and opinion on the subject of cryptocurrencies were raised with numerous questions.

3. Research Questions

The author assumes that cryptocurrencies will make their way in coexisting with traditional currencies and that society will recognize their value in their daily businesses. This may lead to a more linked global economic society with less barriers, similar to the simplification of trade due to the common currency Euro in the European Union.

To clarify this question, there are three perspectives on this topic - on the one hand, the attitudes of the population to cryptocurrency are of great importance for an adaptation, and on the other hand, banks and financial institutions as well as their supervisory authority would also play an essential role in a mass adaptation process. If it is about an adaptation in everyday life, retail will of course also have to play a significant role when it comes to widespread use. So retail is the third point of view on this topic.

In order to achieve measurable results, the following four research questions were defined, which were to be answered in this study.

Main Research question I:

Will the majority of the Austrian population own or plan to own crypto currencies within the next five years?

Main Research question II:

Cryptocurrencies as a tool for speculation are increasingly important. But does the Austrian population think that it is going to be a common payment method within the next five years?

Main Research question III:

Will the rise of cryptocurrencies and crypto assets in general reduce the importance and influence of banks on the Austria economy?

Main Research question IV:

What is the current status in terms of adoption of crypto currencies as an accepted payment method for the top 50 (turnover) online shops in Austria?

4. Methodology & Structure

This thesis tries to provide a detailed overview of how cryptocurrencies and their basic technology works. In order to recognize the advantages, but also disadvantages, of using this future technology are, a deeper understanding is essential. A lot of information has to be gathered from libraries and on-line database research on how these currencies actually work and interact. The advantages and disadvantages regarding real life use cases of cryptocurrencies have to be outlined.

This study aims at portraying the current state and the future development of the crypto currency market in Austria over the next years. In order to provide a clear picture of the matter, three main groups' opinions and developments will be taken into account: the general society, companies and the financial sector. Special focus lays on both the usage of crypto currencies as a payment method as well as a tool for speculation.

The following table shows the four research questions and the survey- and evaluation method used to process them.

RESEARCH QUESTION	RESEARCH METHOD	SAMPLE
WILL THE RISE OF CRYPTO CURRENCIES REDUCE THE IMPORTANCE AND INFLUENCE OF BANKS ON THE AUSTRIAN ECONOMY?	Qualitative, explorative: Expert Interview	Sample: 4 bank representatives from the Austrian banking sector (Raiffeisen, Erste Group, Volksbank, Österreichische Finanzmarkaufsicht)

WHAT IS THE CURRENT STATUS IN TERMS OF ADOPTION OF CRYPTO CURRENCIES AS AN ACCEPTED PAYMENT METHOD FOR THE TOP 100 (TURNOVER) ONLINE SHOPS IN AUSTRIA?	Web based research	Sample: Top 50 (turnover) online shops
WILL A MAJORITY OF THE AUSTRIAN POPULATION OWN OR DOES A MAJORITY PLAN TO OWN CRYPTO CURRENCIES WITHIN THE NEXT FIVE YEARS?	Survey type: Web survey Methods: Dichotomous questions/Likert scale/Semantic Differential	Sample: 297 Target: Austrian, Age 19-65 Population: ~5,700,000
CRYPTO CURRENCIES AS A TOOL FOR SPECULATION IS INCREASINGLY IMPORTANT. BUT DOES THE AUSTRIAN POPULATION THINK THAT IT IS GOING TO BE A COMMON PAYMENT METHOD WITHIN THE NEXT FIVE YEARS?	Survey type: Web survey Methods: Dichotomous questions/Likert scale/Semantic Differential	Sample: 297 Target: Austrian, Age 19-65 Population: ~5,700,000

The research is going to focus on both quantitative and qualitative methods. The initial collection of relevant facts on the topic, was followed by an online questionnaire about attitude measurement of the population regarding the future use of cryptocurrencies.

This is followed by the identification of cryptocurrency experts from the Austrian banking sector as well as the conduct of expert interviews.

3.1 Quantitative Research - Online Survey/Questionnaire

A total of 415 people participated in the survey, from which 308 people have completed it. 3 people who do not live in Austria were excluded from the evaluation. In addition, 1 survey participant under the age of 19 and 7 participants over the age of 65 were excluded from the analysis. Finally, the survey result has 297 finished, relevant and evaluable records.

The arbitrary selection was chosen as the sampling method. The questionnaire was mainly advertised and completed in the social media environment. Various incentives have been created (raffle) to maximize the attractiveness of the survey and consequently the number of participants.

It was ensured not to focus on the direct environment of the experimenter and to avoid distorting demographic homogeneity.

The online questionnaire consists of 17 main questions with 6 demographic survey questions. Amongst the 11 questions of the subject of cryptocurrencies, various questioning techniques were used, for instance Lickert scale, semantic differential, open-ended questions, dichotomous questions and multiple-response questions.

The focus of the questionnaire design was to make participation as short as possible in order to recruit a maximum number of participants.

In the first test runs, the survey was completed by subjects in less than 2 minutes by mastering the survey during this time as the original goal. However, the median in the processing time of a completed survey for all participants was 2 minutes and 51 seconds.

Demographic factors of the sample:

- The gender distribution in the sample consists of 120 male participants and 175 female participants. 2 people did not specify their gender.
- The age distribution is mixed, although a relatively high proportion of 26-35 years old participants took part in the survey, making their category the highest in the sample.
- The distribution of the level of education in the sample shows a prominent share of academics, which is not analogous to the overall population. How this increased value has been achieved cannot be clarified.
- Finally, employment status was also collected for purposes of correlation. These figures are not conspicuous in comparison with databases of the Austrian Federal Economic Chamber and Statistic Austria.

3.2 Qualitative Research – Expert Interviews

In order to find out whether cryptocurrencies and blockchain technologies will and can change the influence and importance of banks, suitable representatives of the Austrian banking world should be interviewed.

The aim was to win expert representatives for an interview from the largest Austrian banking sectors (Raiffeisen, Volksbank, Erste Group, Bank Austria). Unfortunately, no representative of Bank Austria has agreed to an interview. Likewise, the Österreichische Kontrollbank (OeKB) was requested as they have already launched a project on a public blockchain, the Ethereum blockchain. Off the Record, a representative was available for talks, but unfortunately a real interview could not be conducted.

As an alternative interview partner, however, a representative of the Austrian Financial Market Authority (FMA) has agreed to present his view on the topic of cryptocurrencies. Although, the FMA is not a bank, it works closely with the banking community, as a result, it even has a general overview in this area.

Through an online research, experts from each of the banking sectors and the FMA were chosen. In part, these experts were easy to identify, because they are the respective leaders of the bank's internal blockchain workgroups, who can sometimes identify the individuals who have already published papers or publications in this field.

Four guided in-depth interviews were conducted with the following representatives:

- Dr. Marcus Presich: Raiffeisen Bank International AG - Digital Banking, Head of Raiffeisen Blockchainhub
- Mag. Petia Niederländer: Ersten Bank - Head of Operations and Blockchain-Expert
- Mag. Martin Heilinger: Volksbank Wien – Regional Director
- Mag. Marc Gassebner: Financial Market Authority Austria. Senior Fonds Analyst. Main areas of responsibility: Crypto-Assets, distributed-ledger-Technologies

This part of the study is intended to explain the banking view around cryptocurrency issues. For this purpose, expert interviews were conducted with willing experts from the major Austrian banking sectors.

A case-by-case analysis is to be used to individually depict the attitudes and progress in the area of crypto currencies in the respective banking sectors surveyed. A case-by-case analysis contains a statement typically for the interview, a concise statement of the person with regards to the question

and the central topics that were addressed in the interview in relation to the subject of the investigation

For comparative qualitative analysis, the content analysis is used in this work. The focus lies on the qualitative content analysis by Philipp Mayring.

The basic concept of content analysis is the analysis of texts based on category systems that are derived from the material and developed during the analyzing process. The focus is on assigning the material to each particular category that reflects the context contained in the textual material. This is the basis for the subsequent interpretation of the material and constitutes the core of the analysis

5. Answering the Research Questions

Main Research Question I:

Will the majority of the Austrian population own or plan to own crypto currencies within the next five years?

Although much more information can be derived from the study than simply answering the research question, this specifically asked question was answered as follows.

According to the respondents, just 14 percent plan to purchase cryptocurrencies in the next 5 years, including those who already have cryptocurrencies.

Deriving from the answer to the survey question and the general public mood towards cryptocurrencies, it is unlikely that the majority of the population will acquire cryptocurrencies in the medium term.

Main Research Question II:

Cryptocurrencies as a tool for speculation are increasingly important. But does the Austrian population think that it is going to be a common payment method within the next five years?

The majority of those surveyed assume that cryptocurrencies and classic fiat currencies will become coexistent, but the minority thinks, that this technology will become a common payment method in the near future.

In the more distant future, the picture looks slightly different, around 10 percentage points more, about 39 percent of the survey participants are of the opinion that a longer time span, in the survey it was 10 years, cryptocurrencies can become a common means of payment.

However, the survey and the attitude measurement on this research question paint a rather bleak picture for the market penetration of cryptocurrencies.

Answering the question if the rise of cryptocurrencies and crypto assets in general reduce the importance and influence of banks on the Austria economy seems very clear after evaluating the interviews.

Main Research Question III:

Will the rise of cryptocurrencies and crypto assets in general reduce the importance and influence of banks on the Austria economy?

According to the Austrian banks, the growing interest in cryptocurrencies leaves no doubt to the stability and endurance of current payment systems. It gives the impression that this potential upheaval is of no concern to them, and for now, they should be right about that.

The Technology, however has the potential to turn banking on its head. The transformation of the banks to infrastructure and technology providers could be massively accelerated. A possible playing field: trade finance. However, other business areas such as the processing of securities transactions, corporate financing, syndicated loans and bond issues could also come into focus in the next few years. Blockchain applications also have the potential to fundamentally change the core processes of banking, which simplifies overall bank management. One consequence of this development is that the banks gain more time for their core business, advising their customers.

Cooperating and simultaneously competitive banks are building a blockchain ecosystem that increases the efficiency of the processes in each bank. In the event of success, the high investments in building the ecosystem are not only offset by lean, cost-effective IT processes within a bank, but

also in the cooperation between banks, on the other hand, there is also the risk that this technology will not prevail and that many projects have been uselessly implemented.

One thing is certain. Cryptocurrencies have changed the banking world when with them blockchain technology also found its way into everyday banking life.

If one believes the impressions in the interviews, it will be quickly noticed that a system change, should this ever happen, seems to be far away.

Main Research Question IV:

What is the current status in terms of adoption of crypto currencies as an accepted payment method for the top 50 (turnover) online shops in Austria?

The possibility for customers to use cryptocurrencies to purchase goods and services is almost non-existent.

None of Austria's largest online shops offers the possibility to pay directly with cryptocurrencies.

However, there is the possibility to use so-called crypto credit cards as a means of payment indirectly.

6. Limitations and future research direction

All surveys and interviews were carried out in Austria. The culture, level of development and size of the basic population of this study are not representative of the entire world population.

The survey data was collected using an online survey. Possibly, as a result this study tended to take IT-savvy people into account. This affinity could also include, to a greater extent, probands having experience with cryptocurrency.

A study published by Statista in February 2018 shows that of 1850 Austrians surveyed, 9 percent are already using Bitcoin. (Statista, 2018) Although the question was not the same, the results of this survey of which was carried out almost a year later, show a significantly different picture. Almost 17 percent of those surveyed in this study stated that they owned cryptocurrencies. However, since only about 7 percent of those surveyed said that they had ever carried out a

transaction with cryptocurrencies, it can be seen that it is probably due to the different questions and their interpretation by the test subjects that a significant difference could be uncovered here.

In the case of the interviews carried out by experts, it should also be noted that only a restricted group of the Austrian banking scene has agreed to participate in this study. It was therefore not possible to analyze the full spectrum of the Austrian banking scene with regard to the topic of cryptocurrencies.

It makes sense to repeat these surveys at regular intervals. Similar surveys and a comparison of the results can help to derive a trend. Furthermore, similar studies could be carried out in a larger basic population, for example to draw a picture at European level.

7. Overall Conclusion

The survey showed that considerable parts of the population have already come into contact with cryptocurrencies. 95,3 percent of the sample have already heard about cryptocurrencies, while 4,7 percent have neither heard of term cryptocurrencies before nor have any knowledge of its most famous representative Bitcoin. Surprisingly, the data collected shows that a significant part of the sample has already owns cryptocurrency. 7 percent of respondents almost the half of actual cryptocurrency owners in the sample have already completed a transaction that involved cryptocurrencies.

Cryptocurrencies are perceived as an innovative revolution in the financial sector, although great skepticism remains. However, the subjects believe that cryptocurrencies will not find a far-reaching entry into our everyday lives in the near future on the other hand, around 39 percent of those surveyed believe that these alternative currency forms can become significantly more important over the next 10 years.

Another key finding from the surveys is that the majority of respondents believe that cryptocurrencies and FIAT currencies will co-exist as a means of payment in everyday use.

The banking perspective was also defined as another important perspective on the topic of cryptocurrencies. Expert interviews were conducted with topic leaders in major Austrian banks and

the Austrian Financial Market Regulatory Agency, what they are planning in the new technology field.

From these discussions, it emerged that cryptocurrencies have almost no relevance to banks. Hardly any bank plans to present this new topic to its customers.

From the discussions, however, it emerged very clearly that instead of waiting for their impending substitution with blockchain solutions, banks simply want to process their know-how and customer relationships via different blockchain approaches.

From a banking perspective, blockchain technology ensures the integrity of a database by cryptographically linking successive data records. According to the interviews, there are sensible application scenarios for this in various areas. Banks are therefore increasingly interested in blockchain. In the banking sector, for example, blockchain-based projects are currently being developed for payment transactions, derivative products and for know-your-customer regulation management, and some are already being actively integrated into existing processes. This technology will hardly revolutionize the entire financial industry overnight. Future developments take time.

These projects have lasting effects on existing cryptocurrencies if they are based on existing public blockchain solutions. If these public blockchains are used in the real world, they have an actual added value. This study mentions a project from the Österreichische Kontrollbank AG (OeKB) on the Ethereum Blockchain.

As a last perspective on the ability of cryptocurrencies to integrate into our everyday life, that of retailers should not be missing either. First and foremost, that of online trading since cryptocurrency is online based. After all, cryptocurrencies can be used by the population as a means of payment only if they are accepted by retailers.

The results of this part of the study also paint a rather bleak picture on the near future of cryptocurrency. Of the 50 largest online retailers in Austria, not a single one offers the possibility to pay with cryptocurrencies. However, there are workarounds to use indirect cryptocurrencies as a means of payment. For example, crypto credit cards, which offer the option of pre-loading the wallets with cryptocurrencies connected with the certain credit card. When paying at the credit card

terminal, the cryptocurrency is then converted to a defined rate and the merchant receives the respective national currency.

The overall results of the study show that cryptocurrencies are an unstoppable topic. All economic actors deal with the topic. However, these results suggest that cryptocurrencies will continue to accompany us as a speculative object for some time to come.

8. Publications related to the subject of the dissertation

Schindler, M., (2020). Kryptowährungen, Kryptoassets & Blockchain – Innovation im Zahlungsverkehr oder Hype. In B. F. Seyr (Ed.) Innovation and Knowledge Management in Practice: Concepts, Research and Case Studies. Vol. 1. (pp. 79-98). Berlin: Peter Lang Verlagsgruppe.

Schindler, M. (2019). Blockchain - The Revolution of Community-based Decentralized Open Ledger Technologies. International Journal of Business and Social Science (IJBSS). Vol. 10/2, 11-21. doi: 10.30845/ijbss.v10n2p2

Schindler, M. (2019). The evolution of money – a brief introduction into the emergence of cryptocurrencies. IOSR Journal of Economics and Finance (IOSR-JEF). Vol. 10, Issue 1 Ser. IV, 1-7. doi: 0.9790/5933-1001040107

Schindler M. (2018). Blockchain in a Nutshell – An introduction to community based decentralized open ledger technologies. In M. Škare (Ed.), Conference Proceedings of the Third International Scientific Conference for Doctoral Students and Young Researchers (pp. 247 - 268). Eisenstadt: University of Applied Science Burgenland.