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*How are the Norwegian banking market preparing for the implementation of cryptocurrencies or central bank digital currencies (CBDC)?*

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# Abstract

The world is in constant development and new technologies are being created. And the banking industry is no exception. In this research paper I will try to explain how the Norwegian banking market is preparing for the implementation of cryptocurrencies or Central Bank Digital Currencies (CBDC). Since the technology behind cryptocurrencies is relatively new, it would be a good start for further research.

By doing a multi-method explorative approach based on qualitative and quantitative data collection, the chances of getting an answer to the research question increased. From the results of the data collection there was shown that there is a lack of knowledge connected to cryptocurrencies. As a result of this most of the local banks were not able to attend an interview. I was able to get an interview with SpareBank 1 SR-Bank where it was discussed that the development of digital currencies was conducted by Norges Bank. In the preparation for cryptocurrencies amongst the banks, it was said that most banks are watching the development of the technology but are not investing in the research.

The quantitative data collection shows that the need for cryptocurrencies is not yet there, with a great number of the participants stating that they do not have a relationship with cryptocurrencies. And if there was to be an investment and research into the technology of cryptocurrencies, it is expected that the banking industry will have the responsibility to pursue it.

# Preface

This thesis is the last report for graduating the masters program within The University of Stavanger. From this thesis I have been able to use the knowledge that I have received over the past years, which has been a good experience to have. The thesis is aimed at innovation around the banking market which is a very interesting topic.

I want to express my gratitude toward my supervisor, Øyvind Osjord, for putting his interest in my topic and giving me continuous guidance throughout the whole process. He has helped me with discussions and good feedback on my work.

Further I would thank Sparebank 1 SR-Bank for contributing in an interview to help the data collection. I also want to give a thanks to all the participants in the survey which was sent out.

Last but not least, I want to thank my family for believing in me, and that I can finish the thesis. Most of all I want to thank my girlfriend that has always been there for me, for bringing the greatest love, encouragement and support in my life, in addition to providing advice and comments with regard to the writing for the whole thesis.

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# 1. Introduction and motivation

The world is in constant development and new technologies are being created. Within the financial market there is a change in what payment method people use. As the world becomes more and more technological, it makes it important for the banks and financial actors to follow the change. In the last decades the use of cryptocurrencies has increased and are being used to do different financial actions. As for today, the transaction done with cryptocurrencies does not need a third part for guaranteeing that the money will be received. The transaction through cryptocurrency will be guaranteed by the proof-of-work technology implemented in this type of transaction.

The government is working on a potential cryptocurrency which can become a payment method, which is called Central Bank Digital Currencies (CBDC). This is a digital coin which the government can implement as a digital currency. It is Norges Bank who is responsible for developing this product, but there are other actors helping them.

With this knowledge, a question occurs if there is a need for a third party regarding transactions. Since there is an increment in the use of cryptocurrencies, will there be a use of the banking industry? Or does the banking industry have a plan regarding the increment of cryptocurrencies?

It is therefore in this thesis a research question to try and figure out the strategies and the relationship the Norwegian banks have to cryptocurrencies or Central Bank Digital Currencies. The research question states:

*“How are the Norwegian banking market preparing for the implementation of cryptocurrencies or Central Bank Digital Currencies (CBDC)?”*

To answer this research question it will be conducted quantitative and qualitative data collection. And there will be some sub-questions used to try and answer the research question. These sub-questions are:

*“Is there a need amongst the public for a new payment method?”*

*“What relationship do the Norwegian banks have to cryptocurrencies today?”*

Further in the thesis, there will be a chapter explaining the history of cryptocurrencies and Central Bank Digital Currencies, and be given an introduction to what it is. In the third chapter it will be presented with a theoretical basis which will help to answer the research question. The theories included in the thesis are the 4P model, open innovation, and diffusion of innovation. After getting to know some of

the theories, the methodology and the data collection will be presented. Here it will be shown which methods are being used and how the process of gathering data went on. In chapter six the results will be analyzed and presented. After that the results and the theory will be discussed and connected to the research question to try and answer this. At the end, a conclusion will be presented with the most important findings and the possibilities for future research.



## 2. Background of cryptocurrencies

Cryptocurrencies have over the last few years started to become more popular, and as for the economic market it is a relatively new phenomenon. This chapter will introduce the history of cryptocurrencies and how it has become a part of the economic market. Furthermore, there will be more discussion about what cryptocurrencies are and how central bank digital currencies can exist in the market.

### 2.1 Cryptocurrencies

The cryptocurrency market has only existed for a little over a decade. From the start of cryptocurrencies it has been created by several hundred types, but in this thesis it will focus more on the general level of cryptocurrencies (Caporale, Gil-Alana, & Plastun, 2018).

The concept of cryptocurrencies began with the creation of Bitcoin in 2009 by an individual or group of individuals using the pseudonym Satoshi Nakamoto. Bitcoin introduced the concept of a decentralized digital currency based on blockchain technology, which enabled secure peer-to-peer transactions without the need for intermediaries (Nakamoto, 2008).

Following the success of Bitcoin, other cryptocurrencies, often referred to as "altcoins," started to emerge. Some notable altcoins include Litecoin and Namecoin, each with its unique features and purposes (Nofer, Gomber, Hinz, & Schiereck, 2017).

During the period between 2013 and 2017, the awareness and adoption of cryptocurrencies expanded significantly. Bitcoin gained attention from mainstream media, and more businesses started accepting it as a form of payment. The price of Bitcoin began to rise dramatically, attracting investors and speculators. Other cryptocurrencies also experienced substantial growth during this time (Caporale et al., 2018).

The cryptocurrency Ethereum, proposed by Vitalik Buterin, introduced a significant development by enabling the creation of smart contracts. Smart contracts are self-executing contracts with predefined conditions making it possible to build decentralized applications, DApps, on the Ethereum blockchain. Initial coin offerings, ICO, became popular in 2017 as a means for startups to raise funds by issuing their own tokens or cryptocurrencies. Investors could purchase these tokens with existing cryptocurrencies like Bitcoin or Ethereum. While

ICOs offered opportunities for innovation, they also attracted scams and regulatory concerns (Madey, 2017).

The prices of cryptocurrencies, especially Bitcoin, skyrocketed in late 2017 leading to a speculative bubble. However, the market experienced a significant correction in early 2018, causing prices to decline rapidly. This period highlighted the volatility and risks associated with cryptocurrencies. Despite the market correction, infrastructure supporting cryptocurrencies continued to develop. Major financial institutions and companies began exploring blockchain technology and investing in cryptocurrencies. Regulatory frameworks also started to take shape in various countries to address concerns such as money laundering and consumer protection (Liu, Tsyvinski, & Wu, 2022).

Cryptocurrencies experienced a surge in popularity and adoption with more institutional investors, companies and even governments showing interest. Major companies started accepting Bitcoin as a payment method, and prominent financial institutions offered cryptocurrency trading services to their clients. However, increased attention also led to concerns about environmental impact, market manipulation, and regulatory challenges (Liu et al., 2022).

It's important to note that the cryptocurrency landscape is constantly evolving, and new developments are occurring regularly (Huang, 2015). This summary provides an overview, but there are many intricacies and details within each stage of cryptocurrency history.

## 2.2 Blockchain

A blockchain is a decentralized and distributed digital ledger that records transactions across multiple computers or nodes. It is designed to be transparent, secure and tamper-resistant. The blockchain consists of a chain of blocks, where each block contains a list of transactions (Di Pierro, 2017).

In a traditional centralized system, a single authority, such as a bank or a government, maintains and controls the ledger. In contrast, a blockchain operates in a peer-to-peer network, where every participant in the network has a copy of the entire blockchain. This ensures that no single

entity has control over the entire system, making it more resilient and less prone to manipulation (Nofer et al., 2017).

The transactions in a blockchain are grouped into blocks, which are added to the chain in a linear and chronological order. Each block contains a reference to the previous block, forming a chain of blocks, hence the name "blockchain." This linking of blocks makes it difficult to alter past transactions since any change would require the modification of subsequent blocks, which is computationally expensive and would require the consensus of the majority of network participants (Nakamoto, 2008).

One of the key features of a blockchain is its security through cryptographic techniques. Transactions are verified and added to the blockchain using consensus mechanisms like proof-of-work, "PoW" or proof-of-stake, "PoS". Once a transaction is added to the blockchain, it is difficult to alter or delete, providing an immutable and transparent record of all transactions (Nofer et al., 2017).

Blockchain technology has the potential to bring advantages to businesses of all sizes. It offers opportunities for conducting micro-transactions, reducing entry barriers, cutting operational costs, and fostering increased market competition. The introduction of smart contracts has further widened the scope of blockchain applications. It can be utilized in various areas such as decentralized voting, Internet of Things, "IoT", device management, and asset registries, benefiting industries like finance, law, supply chain management, and governmental institutions (Nofer et al., 2017)

## 2.3 CBDC

Central Bank Digital Currencies, "CBDCs", refers to digital forms of national fiat currencies that are issued and regulated by a country's central bank. Unlike cryptocurrencies such as Bitcoin or Ethereum, which operate on decentralized networks, CBDCs are centralized and controlled by the respective central banks (Norwegian Board of Technology, 2022).

Throughout history, central banks have frequently permitted businesses and individuals to make deposits and obtain loans on a large scale. These activities often held greater significance for central banks than monetary policy, both in their day-to-day operations and in terms of

priorities set by top management. In fact, many governments recognized the positive influence of a central bank's commercial operations, including the provision of demand deposits, credit creation, integration of payment systems, and more, on economic growth. These factors served as motivation behind the establishment of such institutions (Fernández-Villaverde, Sanches, Schilling, & Uhlig, 2021).

One notable example of a central bank involved in commercial activities is the Bank of England. Established in 1694 as a privately owned limited-liability corporation, this institution was granted the authority to maximize its profits by engaging in a comprehensive banking business. Its activities included issuing paper currency, accepting deposits, providing mortgage loans, conducting transactions with bills of exchange, as well as dealing in gold and silver (Kynaston, 2017). Over a span of more than two centuries, the Bank of England actively pursued this objective, often competing directly with other commercial banks and lobbying the British Parliament for additional legal privileges to safeguard its private interests against potential competitors.

Another significant development in this context was the establishment of postal savings systems. The first of its kind was the Post Office Savings Bank, “POSB”, in the United Kingdom, which began its operations in 1861. In the United States, a similar system was in place from 1911 to 1967, with the postal savings system accounting for approximately 10% of the assets held by the commercial banking sector by the end of World War II (Fernández-Villaverde et al., 2021). These postal savings systems leveraged the existing network of post offices to provide government-backed deposit accounts and other financial services, such as convenient and cost-effective money transfers, to private citizens. From the perspective of a consolidated public-sector balance sheet, deposits held in a postal savings system are equivalent to deposits held in a central bank, as they represent deposits in two different entities within the same public sector. However, practical considerations and political-economic constraints may lead to a breakdown in the full equivalence of these entities in practice (Fernández-Villaverde et al., 2021).

The clear separation between a central bank, which primarily interacts with primary depository institutions, and commercial banks, which engage with the general public, is largely a development that occurred after World War II. This shift was influenced by various factors, including governments' desire to exercise direct control over discretionary monetary policies following the abandonment of the gold standard (Kynaston, 2017).

The changing economic landscape following World War II resulted in the nationalization of several central banks, irrespective of the political orientation of governments. Examples include the nationalization of the Bank of England in 1946 and the Bank of Spain in 1962 (Fernández-Villaverde et al., 2021). However, it is worth noting that even today, shares of certain central banks, such as the Swiss National Bank and the Bank of Japan, can be traded on stock exchanges. It is important to highlight that these shares come with significant limitations on voting rights. Nonetheless, the fact that such shares are actively traded serves as evidence that central banks were once involved in a broader range of activities beyond traditional monetary policy functions (Diamond & Dybvig, 1983).

The advent of digital currency has reignited discussions on the functions of central banks. Firstly, the concept of central bank digital currencies, “CBDCs” has become viable. Secondly, with the internet, central banks have the option to forego the need for an elaborate branch network, either by establishing their own or collaborating with existing commercial banks. These two factors indicate the potential for reevaluating the rigid barrier between central banks and the general population. However, achieving this objective necessitates the development of a formal economic model (Ferrari Minesso, Mehl, & Stracca, 2022).

## 3. Theory

To be able to get a better understanding of how the research question can be solved, some theories are presented in this chapter. First the part of the chapter will explain the 4P model, which is more of a conceptual framework and not a scientific theory. Further open innovation will be explained and given an overview of what it can bring to the thesis. The final part will include diffusion of innovation to make a theoretical basis for the rest of the thesis.

### 3.1 4P model

The 4P model, or marketing mix as it can be referred to, is a theory which originates from the single P, price, of microeconomic theory (Chong, 2003). This theory was improved by McCarthy (1964) who developed the 4P model from a marketing planning into a practical process (Bennett, 1997). Marketing mix is not a scientific theory, but merely a conceptual framework that identifies the principal decision-making managers make in configuring their offerings to suit consumers' needs. This framework can help with the marketing with both long-term strategies and short-term tactical programs (Palmer, 2004).

The concept behind the marketing mix resembles the process of mixing ingredients for a cake. Just as a baker adjusts the proportions of ingredients based on the desired cake type, the marketing mix allows for similar adjustments tailored to each product (Goi, 2009). Marketing mix has been extremely influential in informing the development of both marketing theory and practice (Möller, 2006). The model consists of four key elements, each starting with the letter "P," which represent different aspects of marketing decision-making. These elements are product innovation, process innovation, position innovation, and paradigm innovation.

#### 3.1.1 Process innovation

Process innovation occurs when an organization addresses an existing problem or carries out a familiar business process in a profoundly distinctive manner, resulting in significant benefits for those involved in the process and those dependent on it. An illustration of process innovation would be the implementation of a completely novel sequence within an established production process, leading to a doubling of production speed, thus saving the organization both time and money. In contemporary times, organizations frequently employ cutting-edge

information technology systems or discover innovative applications for older technologies to spearhead their process innovation endeavors (Fritsch & Meschede, 2001).

Process innovation typically entails more than just the adoption of a revolutionary approach or technology. It often necessitates an extended planning phase and the backing of top-level management. Moreover, process innovation is riskier compared to incremental improvements, as it involves a higher degree of cultural and structural change (McElheran, 2015).

Process innovation can generate value to either internal customers, including employees or the actual organization itself, or it can create value to external customers, including business partners, end users or actual consumers. Values stemming from process innovation include reducing the time it takes to produce a product or perform a service; increasing the number of products produced or services provided within a time frame; and reducing the costs per product produced or service provided. Additionally, process innovation can generate significant gains in product quality and service levels. Overall, an individual organization needs to see a significant increase in some of its key performance indicators, “KPIs”, to be a true process innovation (McElheran, 2015).

### 3.1.2 Product innovation

Product innovation is commonly perceived as the quintessential form of innovation. When people discuss innovation, they often refer to product-based advancements. These innovations encompass modifications made to a startup's or organization's offerings, be it products or services (Goi, 2009). They can involve altering the design of an existing product or completely transforming the product or service itself. Product innovation doesn't always necessitate the creation of an entirely new product that addresses an entirely new problem. Take, for example, the first computer that was introduced. It was designed for a market that didn't previously exist, targeting an audience that didn't have access to such technology before. Following the introduction of the initial computer, subsequent generations of computers have primarily consisted of incremental changes and improvements in technologies and designs. For instance, advancements were made to make computers more lightweight and time-efficient (Goi, 2009).

Innovation is not limited to creating entirely new products or services. It can also involve enhancing existing products by introducing new features or improving their functionality. Furthermore, innovation extends beyond just products and encompasses services, processes, and even business models. Innovation can manifest in various forms within an organization, allowing for advancements and improvements across multiple aspects of its operations (Möller, 2006).

### 3.1.3 Position innovation

Positioning innovation involves repositioning a product or service by introducing it to a new market or presenting it with a unique angle. A noteworthy example of this is AirBNB, which initially focused on catering to conference attendees before expanding its offerings to the general holiday and travel industry (Francis & Bessant, 2005).

Position innovation plays a crucial role in enabling other types of innovation. It is the foundational step in introducing something novel, as it creates the necessary space and opportunity to do so. By repositioning a product or service, positioning innovation can fundamentally change how it is perceived or utilized. It allows for shifts in perspective and opens up new possibilities for how a particular process or product can be approached (Baregheh, Rowley, & Hemsworth, 2016).

### 3.1.4 Paradigm innovation

Paradigm innovation refers to a significant shift or breakthrough in the way things are perceived, understood and approached within a particular field or industry. It involves challenging existing assumptions, redefining traditional practices, and introducing novel concepts that fundamentally transform the way problems are solved or opportunities are pursued (Baregheh et al., 2016).

When a paradigm innovation occurs, it has the potential to reshape entire industries or fields by challenging established norms and practices. It can lead to the creation of new products, services, or business models that were previously unimaginable. Paradigm innovations can also bring about significant social, cultural, or environmental changes (Bessant & Tidd, 2007).



Paradigm innovation can arise from various sources, such as advancements in technology, scientific discoveries, changes in societal needs or expectations, shifts in economic conditions, or the convergence of multiple disciplines. It requires individuals or organizations to think beyond incremental improvements and embrace a more radical and visionary mindset (Baregheh et al., 2016).

### 3.2 Open Innovation

Open innovation is a relatively new and rich concept. After reviewing 150 open innovation papers, Dahlander and Gann (2010) conclude that building a coherent body of knowledge is hard, hence the different definitions which is been used. Including this there is a difference between the aspects in the theory that the researchers use (di Benedetto, 2010).

Open innovation is a concept that emphasizes the collaboration and sharing of ideas, knowledge, and resources between organizations, individuals and communities to foster innovation. The definition of open innovation which is mainly used is “*the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and to expand the markets for external use of innovation, respectively*” (Chesbrough & Vanhaverbeke, 2006). It challenges the traditional closed innovation model where organizations rely solely on internal research and development to drive innovation (Chesbrough, 2003).

In open innovation, organizations actively seek external inputs and engage in partnerships with external entities, such as customers, suppliers, universities, startups, and other stakeholders. It recognizes that valuable ideas and expertise can come from a wide range of sources beyond the boundaries of a single organization.

Significant advancements in the broader innovation landscape encompass societal and economic shifts in work dynamics, heightened labor specialization driven by globalization, enhanced market structures facilitating the exchange of ideas, and the emergence of novel technologies fostering collaboration across vast geographical expanses (Dahlander & Gann, 2010). The key principles of open innovation include inbound innovation, outbound innovation, collaboration, openness and transparency, and value creation.

### 3.2.1 Inbound Innovation

Organizations actively seek external ideas and technologies to complement their internal capabilities. This can involve acquiring external technologies, licensing intellectual property, or collaborating with external partners to access new knowledge (Gassmann & Enkel, 2004).

### 3.2.2 Outbound Innovation

Organizations leverage their internal ideas, technologies, and intellectual property to create value through licensing, spin-offs, or joint ventures with external partners. This allows them to monetize their intellectual assets and reach new markets (Dahlander & Gann, 2010).

### 3.2.3 Collaboration

Open innovation emphasizes the importance of collaboration and partnerships between organizations and external stakeholders. This can involve co-creation of products or services, joint research and development projects, or shared resources and expertise (Huizingh, 2011).

### 3.2.4 Openness and Transparency

Open innovation encourages the sharing of information, knowledge, and data. This can be achieved through platforms, networks, or communities that facilitate the exchange of ideas and collaboration (Chesbrough et al., 2006).

### 3.2.5 Value Creation

The ultimate goal of open innovation is to create value by combining internal and external knowledge, technologies, and resources. This can result in faster development cycles, increased market responsiveness, improved products or services and new business opportunities (Chesbrough et al., 2006).

Open innovation has gained prominence as a response to the increasing complexity and pace of technological advancements. By tapping into a broader ecosystem of ideas and expertise, organizations can enhance their innovation capabilities and stay competitive in a rapidly evolving landscape (Huizingh, 2011).

### 3.3 Diffusion of innovation

The theory around diffusion of innovation has been discussed since the early 1900 by the French sociologist Gabriel Tarde (Toews, 2003), but has later been developed by the likes of Everett Rogers (2003) to the current theory we use today. The diffusion of innovations theory describes the pattern and speed at which new ideas, practices or products spread through a population. Rogers (2003) created a model to showcase this process, emphasizing that typically a small group initially embraces a new idea and begins using it. As these early innovators continue to advocate for it, more and more people become receptive, ultimately leading to the formation of a critical mass. Gradually, the innovative concept or product spreads throughout the population until it reaches a point of saturation. From this it was created five main players in the theory, which are innovators, early adopters, early majority, late majority and laggards (Lundblad, 2003).

#### 3.3.1 Innovators

Innovators are the pioneering individuals who eagerly embrace new innovations. They possess a willingness to take risks, tend to be the youngest in age, belong to the highest social class, exhibit strong financial stability, and maintain extensive social connections. Innovators have close proximity to scientific sources and actively engage with other innovators. Their risk tolerance allows them to adopt technologies that may have uncertain outcomes or even fail. Thanks to their ample financial resources, they are able to absorb any setbacks or failures that may arise (Rogers, 2003).

#### 3.3.2 Early Adopters

The second fastest group of people to embrace an innovation consists of individuals with the highest level of influence over others' opinions. Known as early adopters, they are usually younger, possess a higher social standing, greater financial stability, advanced education, and are more progressive in their social attitudes compared to late adopters. They are more careful and discerning when choosing what to adopt compared to innovators. They understand that

making wise adoption decisions helps them maintain a pivotal position in communication networks (Rogers, 2003).

### 3.3.3 Early Majority

The individuals in this category adopt an innovation after a considerable amount of time, which is notably longer than the innovators and early adopters. Known as the Early Majority, they tend to have a slower pace of adoption, possess an above-average social status, have connections with early adopters, and rarely hold positions of opinion leadership within a system (Rogers, 2003).

### 3.3.4 Late Majority

Individuals in this category exhibit a tendency to adopt an innovation after the average member of society. Referred to as the Late Majority, they approach innovations with a significant degree of skepticism and typically join in once the majority of society has already adopted the innovation. Late Majority individuals are characterized by their skepticism, below-average social status, limited financial resources, interactions primarily with others in the late and early majority categories, and a lack of significant opinion leadership (Kaminski, 2011).

### 3.3.5 Laggards

Individuals in this category represent the final group to adopt an innovation. Unlike previous categories, they exhibit minimal or no opinion leadership. These individuals typically harbor resistance towards change agents and often belong to an older age group. Laggards are often characterized by a strong adherence to traditions, likely have the lowest social status, limited financial flexibility, and tend to be the oldest among all other adopter categories. They primarily interact with family and close friends, and possess minimal to no opinion leadership (Kaminski, 2011)

## 4. Methodology

This chapter will include a description of the chosen method that was used to answer the research question introduced earlier. Furthermore, it describes how the research model has been designed and how empirical data has been collected. Finally, the strengths and weaknesses of the method are highlighted.

For the research to become reliable the data and information have to be collected as accurately as possible. With research methods there is an opening for compromising the learning of collecting, processing, organizing, analyzing, and interpreting social facts in a systematic aspect, which opens for others to be able to apprehend the research (Halvorsen, 2003).

By using both qualitative and quantitative analysis we get a mixed method procedure. The numerical data is retrieved from the use of a survey, which makes up the data included in the quantitative data. Data from the interview and the literature is the basis for the qualitative analysis. It would not provide a comprehensive analysis by using only one of the methods (Creswell, 2014). And this is one reason for using the chosen research design to provide an in-depth analysis of the topic.

### 4.1 Quantitative data

The quantitative data is collected through a survey with the intention to get an overview over peoples relationship to the using of cryptocurrencies and if it can substitute the current payment method. The survey was created through Google Forms and consisted of ten main questions connected to the research question, and I also included three control questions.

These questions will help find a possible need amongst people, and can give an insight if banks should have more focus on making it possible to use cryptocurrencies through the banking system. To be able to get as many answers as possible, the survey was shared through social media with the intent of creating a “virtual snowball sampling” (Parker, Scott, & Geddes, 2019).

One of the biggest strengths of a questionnaire is that this method enables statistical analysis and comparison of answers between many respondents. A questionnaire can also seem less stressful than methods that require physical presence by giving the respondent more time to consider their answer (Bang, 2011).

## 4.2 Qualitative data

For the qualitative data the main focus was to identify the different banks' thoughts towards the use of cryptocurrencies and to see if there has been any development regarding making it possible to include in their use. There was one interview conducted with SpareBank 1 SR-Bank, and three email correspondences with Sparebanken Sør, Jæren Sparebank and Handelsbanken. From the emails it was discussed that the banks were not able to give good enough answers regarding the topic of the thesis. As SpareBank 1 SR-Bank is a big and established bank they were able to get interviewed. It was made a summary of the answers from the interview, which was then analyzed empirical.

In the aftermath of the COVID- 19 pandemic, it seemed natural to have the interview via Microsoft Office Teams instead of meeting face-to-face. The interview was audio-recorded with the permission from the interviewee, and was then transcribed into a written text. By having the interview as an online meeting it opens for more efficient data collection and can be beneficial due to lower costs, possible distances and the time required to conduct the interview (Saunders, Lewis, & Thornhill, 2009). Since the interview was conducted through Microsoft Office Teams it made it possible to include web-cameras and therefore helped with the challenges of not being able to read the body language through a telephone interview. Because the interviewee agreed to be audio-recorded the conversation went more smoothly and the issue of taking notes could be eliminated (Saunders et al., 2009).

## 4.3 Limitations and constraints

The use of cryptocurrencies is relatively new in the economy segment, and it has therefore not been conducted to much research around the thesis theme. The research is more focused on the

part regarding development in central bank digital currencies, which is more focused around the governments work toward a form of cryptocurrencies (Nica, Piotrowska, & Schenk-Hoppp, 2017; Syrstad, 2023). This is a limitation on the thesis, but it is an opportunity to start getting an awareness towards the development and research of cryptocurrencies on a day-to-day basis.

People and firms' knowledge of cryptocurrencies will, in the case of this study, have a big impact. Whereas since the use of cryptocurrencies is quite new, it can be a limitation on the collected data. There will be some limitations and constraints in the selection for the survey, based on the time frame, the number of participants and its diversity. There will furthermore be some limitations regarding location of the participants since the distribution of the survey was conducted through Facebook. For further research it is recommended to get a bigger pool of participants.

The technology surrounding the processes in using cryptocurrencies is in constant change and it may impact the earlier research, and to be able to predict how the banking market prepares itself, it is more relevant to compare earlier research and the different projects that are giving out updates.

#### 4.4 Reliability and validity

To make the data collection more strengthened regarding the validity and reliability, Jick (1979) states that using a multi-method explorative approach by qualitative and quantitative data collection, it strengthens the validity and reliability. Since the interview was conducted with an expert in his field, the qualitative data will be considered somewhat reliable, but the reliability can be affected by only concluding one interview. Furthermore, the interviewee can have a certain degree of biased opinions which will not be sorted out due this.

For the quantitative data collection, it was conducted a survey which makes it possible to do an analysis and comparisons of many responses at the same time. But according to Dalland (2017), some of the disadvantages of questionnaires are that they provide few opportunities to check the respondent's understanding and interpretation of the questions. The number of questions must be relatively limited. The data collected is taken from a small pool of possible responders and will therefore have less reliability.

## 5. Data collection

In this chapter it will be presented the data collection process. For this thesis the data will be firsthand gathering data, with a mix of interviews and a survey. Firstly, the choice of population will be presented, where for this thesis it was split into two different pools regarding which method was used. Further, it will be explained the use of survey, which measuring instrument was used, how it was spread to questionnaires and the observation method. For the last part of the chapter, a similar walkthrough will be done regarding the interview.

### 5.1 Population

To be able to answer the research question “how are the Norwegian banking market preparing for the implementation of cryptocurrencies or central bank digital currencies (CBDC)?”, it was natural to try and come in contact with some of the local banks as this is directly correlated to the research question. The initial contact with the banks was through email to the media contact. In the email there was information on me as a student and the thesis’ theme was briefly explained. Further the interview guide was attached in the email for the receiver to go through the questions. The email was sent to seven banks; SpareBank 1 SR-Bank, Handelsbanken, Jæren Sparebank, Sparebanken Sør, Sparebanken Vest, Den Gule Banken Sandnes Sparebank, where four of them answered with one agreeing on an interview.

The quantitative data were gathered through a survey, where the goal of the answers was to have a small market analysis. From the survey we would see whether there is a need in the market for a change, and if it should be developed an implementation of cryptocurrencies. With the bases in the research question the survey primarily consisted of ten questions to look at the questionnaire's relationship to crypto and to see if there was a market for using crypto as a payment method. To reach as many people as possible it was used the “virtual snowball sampling” method, where the goal is to share the survey with friends and people you know through social media, and for them to spread the survey further to other friends (Parker et al., 2019). Even if this will be a limitation on whether the survey will be reliable or not, the method is beneficial to get as many answers as possible.



## 5.2 Survey

A survey can help with gathering information when the researcher has a basic understanding of the problem area. The purpose of this design, which is referred to as descriptive design, is to describe situations in a specific area (Gripsrud, Olsson & Silkoset, 2006). This survey was sent out to normal people to ask about their relationship and habits when it comes to payments. The survey was created in Google Forms, which is a free program for designing questionnaires. Since the survey was spread to people living in Norway, all the information and questions were written in Norwegian so it would be easier for those who were asked to understand the survey.

The first question that had to be answered was if the person agreed to give consent of using the answer and to analyze the answers that they gave further in the master's thesis. All 110 respondents accepted this consent. This is a principle of informed consent, which gives the respondents the opportunity to understand what they will answer on and what it will be used for (Fangen, 2004). Further, it included a control question on the participants' age to be able to see that the survey included people of all ages.

To help answer the research question it was asked ten questions in the survey connected to the use of online payments. These questions were:

1. *What is your relationship with cryptocurrency?*
2. *How often do you use cash to make a payment?*
3. *How often do you set up a payment in your online bank that is not an e-invoice?*
4. *How often do you pay abroad in online shops or through transfers to persons/companies?*
5. *Have you been frustrated by the time it takes to make a payment through your bank?*
6. *Who should be responsible for the development of payment methods?*
7. *How comfortable would you be using cryptocurrency as a payment method?*
8. *Do you think there is a need for control (by the bank/state) on the transactions that are carried out?*
9. *Would it have been easier with one currency for all online shopping?*
10. *Will cryptocurrency be the payment method of the future?*

The first question made it possible for the respondents to answer multiple of the suggested answers or write their own. For the rest of the questions, it was possible to give an answer

between a specter on how often the respondent did the action, how much you agree with a statement, and between different actors in the economy market.

The results from the survey were imported to Microsoft Office Excel, where graphs were created to do the analysis of the answers. The focus was on the percentage that was answered to get an overview of the situation and need for a potential new payment method.

### 5.3 Interview

Since the research question has its focus on development regarding banks, it was necessary to get in contact with a speech person from different banks. An email was created with information about the study program and what the thesis was about, with the interview guide in the appendix. By sending the email to a spokesperson in the respective banks, it allowed them to connect me to the right person regarding the knowledge and work around cryptocurrencies, and schedule a potential meeting.

The use of in-depth interviews is, according to Gripsrud et al. (2006), a good method to gather more information from personal experiences and the industry's view on the topic. Since the interviews are based on a common interview guide, they are defined as partly structured. But the use of interviews also allow for unstructured conversation beyond defined questions by using phrases such as "please elaborate on the answer". By using this method it is often a good way to possibly bring out several sides of a question. In individual conversations, there is also a greater possibility that the interviewer can control the conversation and influence the respondent's answers (Gripsrud et al, 2006).

Due to the interview guide's flexibility, follow-up questions and encouraging questions where it has been necessary to obtain additional information from the informants were allowed (Johannessen et al., 2011). The interview guide consisted of nine main questions with some followup questions. Since it was a guideline for the interview, the followup questions may or may not be included regarding how the conversation goes. The main questions were:

1. *What is your relationship with cryptocurrency?*
2. *Why do you think there has been a slow development regarding the efficiency of payment and transactions?*

3. *Do you have any cooperation with other banks for the development of payment methods?*
4. *Today there are different types of cryptocurrencies like stablecoins, CBDC and blockchains. Is there any of these that you think will be leading in digital money?*
5. *With the use of cryptocurrency for transactions, do you think there will be made a process equal to what we have today, or are we looking at a new transaction method that will change how we do transactions?*
6. *What is your thought on safety regarding the use of cryptocurrency?*
7. *In most cases of stablecoins, it is tried to get a one-to-one value with the dollar. If the stablecoin comes to Norway, do you think it will be connected to the dollar or another currency?*
8. *Looking at cryptocurrency you will see that the efficiency of transactions will be higher due to not having a third party to register the transaction – what will the consequences be because of this?*
9. *Will the bank look at cryptocurrency as an investment service like funds and stocks or do you think it can be developed to become a payment method?*

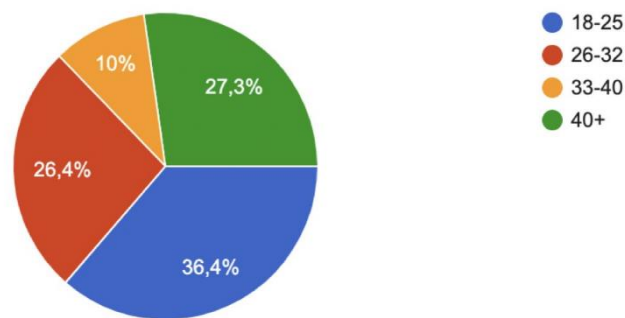
After the interview has been completed, a transcript of the conversation will be made. From the transcripts there will be an analysis and a comparison of the answers given. Furthermore for the results there will be a summary of the answers after it has been compared to each other.

## 6. Results

In this chapter I will present the results I received from both the survey and from the interview.

### 6.1 Results from the survey

In this survey there were 110 answers to check people's relationship to the use of cryptocurrencies. Since there was not a hand-picked group of people to answer the survey there were some differences in the age group. As age was a control question, the main goal was to get an equal amount of each age group.



*Figure 1: What is your age?*

#### 1. What is your relationship with cryptocurrency?

From the first question we see that most people who have answered do not have a relation to crypto currencies and are likely not to have engaged in this kind of financial opportunity. But close to the 55 people (50% of the answers) who did not have a relation to cryptocurrencies, there were 51 (46,4% of the answers) which relate cryptocurrencies to an investment opportunity.

Furthermore, there was a little proportion which sees cryptocurrencies as connected to the criminal environment (15,5%) and that crypto is a way of doing payments.

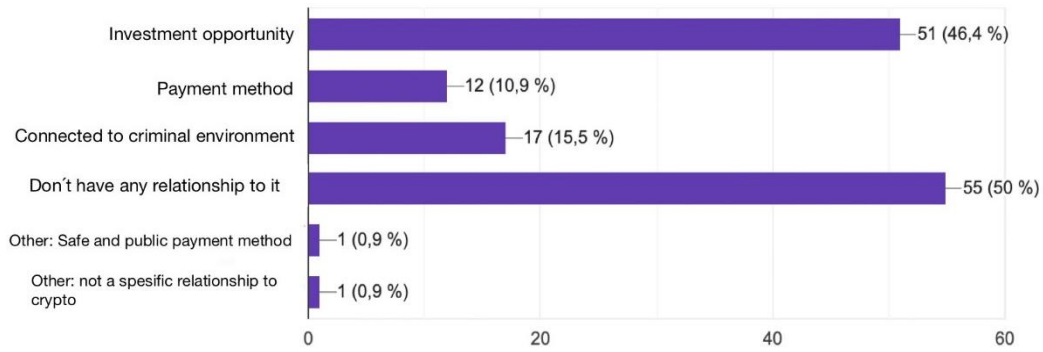


Figure 2: What is your relationship with cryptocurrency?

## 2. How often do you use cash to make a payment?

For this question the main goal was to get an overview of how often cash is used, which regarding Esselink & Hernández (2017) is becoming less and less used. In the answers it is easy to see that most people do not use cash, with 23,6% saying that they never use it and 60% saying that they rarely use cash.

There are just 18 of the 110 people asked that use cash 3-5 times a half year or more, with no one saying that they use cash every day.

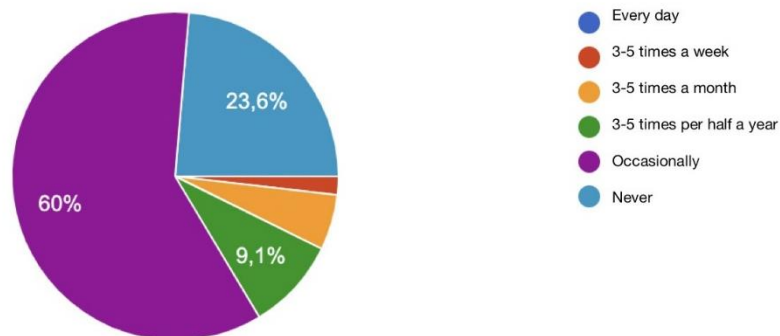


Figure 3: How often do you use cash to make a payment?

3. How often do you set up a payment in your online bank that is not an e-invoice?

Payments come in different options, and paying from the online bank is one of them. In the survey it shows that this option is partly used where the majority uses it from 3-5 times a month till the ones that rarely do it. 7,2% of the answers indicate that these payments are used several days in the week or never pays by registering it through the online bank.

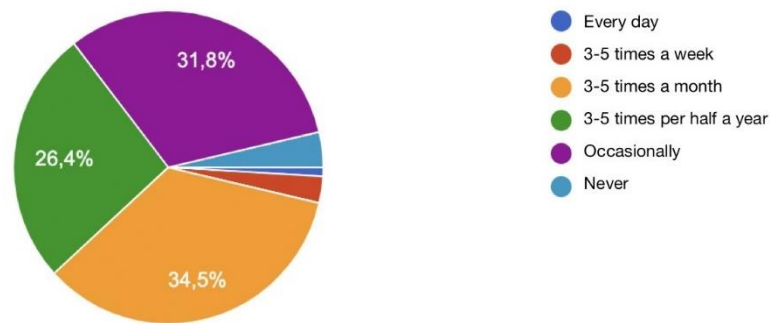


Figure 4: How often do you set up a payment in your online bank that is not an e-invoice?

4. How often do you pay abroad in online shops or through transfers to persons/companies?

Purchases done online makes it easier to buy from other countries, but for this survey the participants seem to not use foreign websites or transactions much. With 17,3% of them saying that they never do it, and the biggest share of 44,5% says that they rarely do foreign transactions.

There is no answer that says they do payments through online payments more often than 3-5 times a month. 3-5 times a month was the most regular payment which was answered with 12,7% of the participants.

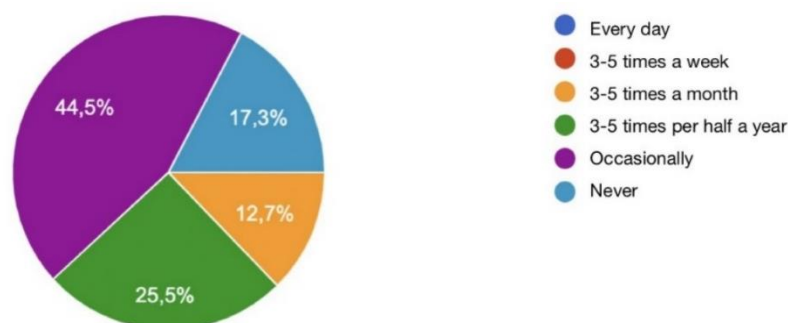


Figure 5: How often do you pay abroad in online shops or through transfers to persons/companies?

5. Have you been frustrated by the time it takes to make a payment through your bank?

For banks in Norway there is a registration of payment that happens through working days. But payment done during the weekend is not registered until Monday. Regarding this, 30% of the participants are disappointed by the time it takes for these transactions. For the rest of the participants this is not an issue, or they have not been frustrated over the situation.

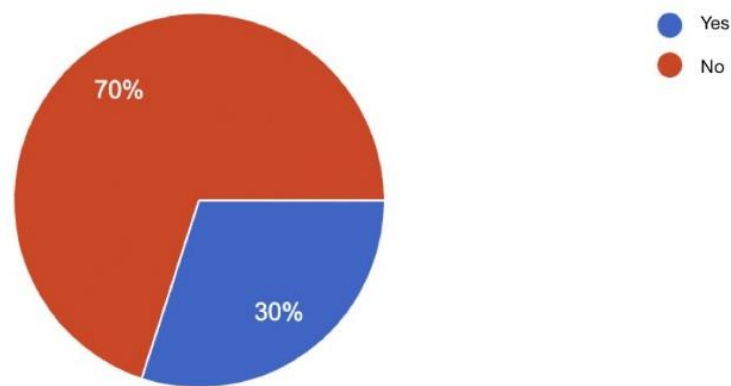


Figure 6: Have you been frustrated by the time it takes to make a payment through your bank?

6. Who should be responsible for the development of payment methods?

Regarding the development of payment methods, the answer in the survey indicates that it should be the banks that will be the part that changes it. The results show that 59,1% agrees that it is the bank's responsibility to be the front going in changes regarding payments methods.

There is an equal amount that means the government should be in charge of the development of payment methods as for the users. From the survey it is 17,3% of the participants which have given these answers. For the rest of the participants, 6,4%, the responsibilities lay on other suppliers.

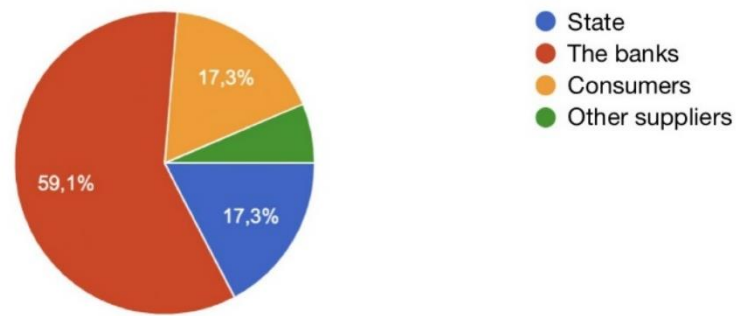


Figure 7: Who should be responsible for the development of payment methods?

7. How comfortable would you be using cryptocurrency as a payment method?

The uses of cryptocurrencies are different than we normally use payment methods, and as we can see over half of the questionnaires was not comfortable with using cryptocurrencies. 28,2% said that they were uncomfortable, and 24,5% was a little uncomfortable with the use of cryptocurrencies.

20,9% of the questionnaires did not have an opinion on if they would be comfortable in using cryptocurrencies as a payment method. For the ones that were comfortable, 10 of them were a little comfortable. The 19 others said that they were comfortable with the possibility of using cryptocurrencies as a payment method.



Figure 8: How comfortable would you be using cryptocurrency as a payment method?



8. Do you think there is a need for control (by the bank/state) on the transactions that are carried out?

For the question whether there is a need for control over the transaction which is done, the majority agrees that the banks or the government should oversee controlling the transactions which are being done. 34,5% of the questionnaires agreed with the statement that the bank or the government should control the transactions and 38,2% somewhat agreed with that statement. There was 19,1% that said that they did not have an opinion if there was a need for control over the transaction being made.

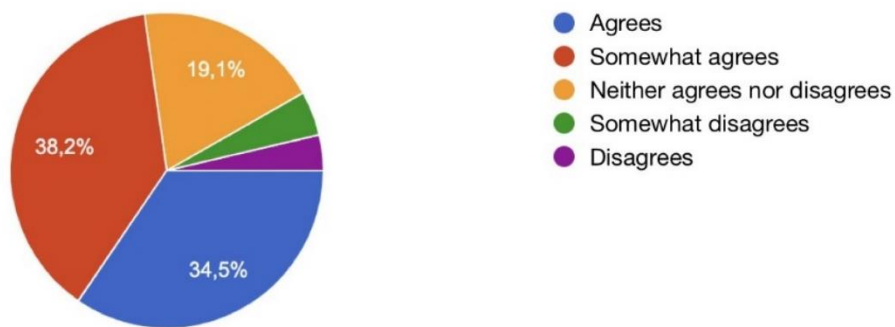


Figure 9: Do you think there is a need for control (by the bank/state) on the transactions that are carried out?

9. Would it have been easier with one currency for all online shopping?

For online shopping the different websites have different currencies when you pay, and in the question which if there should only be one currency 28.2% agreed with this. Furthermore 24.5% were somewhat agreeing with the statement if it would be easier with only one currency for online shopping.

10,9% are disagreeing that it would be simpler with one currency for online shopping and 8,2% are somewhat disagreeing with the statement. The ones that do not have an opinion on the case make out 28,2% of the questioners.

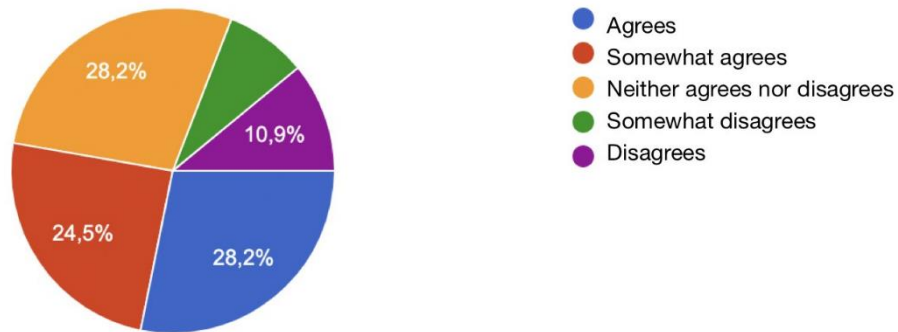


Figure 10: Would it have been easier with one currency for all online shopping?

#### 10. Will cryptocurrency be the payment method of the future?

The largest part, 34,5%, of those who responded to the survey have said that they neither agree nor disagree that cryptocurrencies can be the payment method for the future. Furthermore, we can see that there is an uncertainty if cryptocurrencies will be the new payment products, with the smallest percentage agreeing and disagreeing. There were 8,2% which agreed with the statement and 14,5% were disagreeing.

There is an even distribution of people between somewhat agreeing, with 21,8%, and somewhat disagreeing, with 20,9%, on the matter if cryptocurrencies can be the next method of payments.

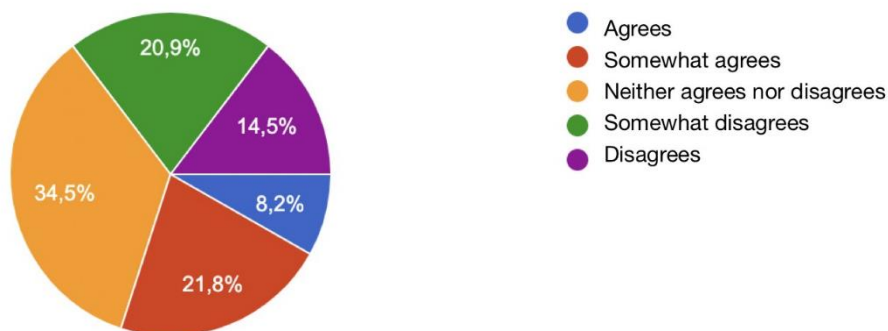


Figure 11: Will cryptocurrency be the payment method of the future?

## 6.2 Results from the interview

As written in the chapter about the qualitative method, I was only able to get one interview. I got emails from Sparebanken Sør, Jæren Sparebank and Handelsbanken where it was discussed that the banks would not be able to give good answers in an interview. Below is what these three banks answered when I asked if they wanted to be interviewed for this master thesis:

### Sparebanken Sør

- *We try as best we can to stand up when students ask, but right here the questions are deep into a topic that has too many unsettled answers - and no one has enough expertise under their skin for us to be comfortable answering.*

### Jæren Sparebank

- *I have looked through the interview guide, and see that no one at work is up against cryptocurrency in relation to the questions you want answers to. Then you may have to contact the Eika alliance and see if there is anyone there who can answer this. In the main, we work against cryptocurrency in relation to money laundering/fraud.*

### Handelsbanken

- *Unfortunately, we have not come far enough in formulating a common view or strategy around cryptocurrency in Handelsbanken for me to present it on behalf of the bank.*

As I mentioned, SpareBank 1 SR-Bank was the one bank that was able to participate in an interview and this is because they are working closely with different actors regarding the uses of cryptocurrencies and below you can read about the findings that came from the interview.

From the question regarding the interviewees relationship with cryptocurrencies, we get some insights of how people working with cryptocurrencies are using it themselves. In this case the interviewee uses crypto as an investment opportunity, where he is testing this kind of currency to get a better understanding of it. The interviewee has earlier spoken to a professor in Austria which told him that 1% of the global capital market consists of cryptocurrency, and if people then have under 1% of the investments in crypto they are working against the global capital market.

The use of crypto will be a change for many and there might be a speculation if the change is good or if it opens for more criminal activity. Regarding this the interviewee thinks that people who are thinking it will be more criminal activity, they are close minded. From his experience people are starting to move away from this thought. This is because with cryptocurrencies there are the possibilities of tracking the money, but as it is today with cash there is little to no possibility to track where the money comes from. The way cryptocurrencies or CBDC are being made, is to make it simpler to track, but as for the technology the banks have not become comfortable enough to start implementing cryptocurrencies in their systems.

When the question regarding if cryptocurrencies can be the next payment method, the answer is that crypto as known today will probably never be more than an investment opportunity. On the other hand, CBDC can create a payment method since it will only be a patent method controlled by a central bank. This development with CBDC that Norges Bank is working with could change the way we do payments, but until this happens the interviewee do not think that cryptocurrencies will be the next method of paying.

With the development of using cryptocurrencies in day to day banking, there is not too much work. But different actors are talking together and the situation regarding crypto is being watched. Based on what the interviewee says it can be interpreted that Norges Bank will be responsible for the development and work around CBDC.

As stated earlier the interviewee said that crypto will probably only be an investment opportunity, but it seems like the banks are not prioritizing to make it possible for people to do investments through their day to day bank. This solution can be implemented later on.

Doing payments to accounts in other countries is something that is being looked into and worked with. As of now it is not doing so well, but there are ambitions of getting a more efficient transaction process. Norway is in a collaboration with Sweden and Denmark with trying to develop a system that makes it simpler to do transactions between the countries. As for today, we use the SWIFT-system for doing payments to other countries, and this does much of the same as what crypto could have done. The question could be if it really is a necessity of changing into crypto. In the future there might be a point where you can use the underlying infrastructure of crypto to make the transactions more efficient.

The change over to the possible use of CBDC will give the government or the banks better control over transactions, which can have an impact on the privacy of people. As the interviewee states, privacy is starting to decline where people are starting to be more and more surveillanced. In Norway, compared to London or Shanghai as an example from the interviewee, the surveillance is not too bad. With the creation of CBDC the control of transactions that can be tracked is one of the following steps of losing privacy, but the benefits of CBDC are greater than the cons.

Since Norway is a small country, the use of a stablecoin connected to NOK will also be quite limited. If there is going to be a stablecoin in Norway it will probably be CBDC for Norges Bank.

The registration process of transactions will not change with the technology connected to crypto. The work Norges bank is doing regarding CBDC is that it will not be a savings or investment product, but rather a payment product. It might increase the efficiency of payments, but the registration will still be at the same rate. The best way of describing the use of CBDC is that it will work as a debit or credit card.

## 7. Interpretation and discussion

In this chapter it will be presented a discussion regarding the results and how we can connect them to the theory. Further the research question, *how are the Norwegian banking market preparing for the implementation of cryptocurrencies or central bank digital currencies (CBDC)*, will be discussed and compared to the findings to see whether there is an answer to it.

### 7.1 Comparing the qualitative and quantitative data

Before connecting the result to the theory, the qualitative and quantitative data will be analyzed together to get an overview of what similarities and disagreements there are.

#### 7.1.1 Relation to crypto

In the results it shows that the thought around cryptocurrencies generally is an investment opportunity. This is supported by the representative from Sparebank 1 SR-Bank and 51 respondents agreeing that the relationship they have to cryptocurrencies is that it is an investment opportunity. The technology around cryptocurrencies is still new for most people, and from the survey there were 55 people that do not have any relationship with the use of crypto.

From the survey there was a small percentage that still thinks that crypto is connected to criminal activities. But as the interviewee from SpareBank 1 SR-Bank mentions, fewer people share this thought. As the knowledge of what cryptocurrencies are and how it works, people will understand that it is a currency that is available for tracking and easier to find the origin of the money.

#### 7.1.2 Transaction efficiency

From the survey there is a big indicator that the use of cash here in Norway is relatively small, and for some time now the use of debit and credit cards is used for shopping. More of the payments happen online and we see that money is becoming more digitized. This increases the need for efficiency since there is a constant development in the society. Since the use of crypto does not use a third party with transactions, the efficiency of payment registration will be increased and there will be less time for the receiver to get their money.

The time for a transaction to be registered and received depends on if it is being paid nationally or if it is a foreign payment. Cryptocurrencies can have the biggest impact regarding efficiency if it can be implemented as a new way of paying abroad. Today we have a system called SWIFT which is doing some sort of what cryptocurrencies could do, and this is according to SpareBank 1 SR-Bank one of the reasons why there has not been too much focus on cryptocurrencies. For the future, there is a possibility that technology used in cryptocurrencies can help in developing a more efficient payment method abroad.

Implementation of CBDC regarding SpareBank 1 SR-Bank and Norges Bank will have a better use for digital currencies. With this creation there will be easier to do transactions between the Norwegian banks, and that might be enough which is shown in the survey where most of the ones that answered said that they do not or rarely do foreign transactions.

### 7.1.3 Responsibility for the development of payment methods.

Within who is responsible for the development of payment methods there is a difference from the survey to the bank. In the survey most of the questionnaires answered that the banks are the ones that are responsible for the development. After the interview with Sparebank 1 SR-Bank it was revealed that it should be Norges Bank or the state that will handle the development of a new payment method, but the other banks are watching the development of cryptocurrency.

### 7.1.4 Control over transactions - bank or state?

To be able to have more control over the transaction being done, Norges Bank has to implement CBDC as a payment method. Since CBDC increases the possibilities of having control over transactions, people will lose some of their privacy. The interviewee from SpareBank 1 SR-Bank mentioned that there should not be a problem as long as there is nothing to hide. It also seems like the questionnaires from the survey are agreeing with that.

### 7.1.5 Future use of cryptocurrencies

Regarding the future of the cryptocurrencies there is an uncertainty, where SpareBank 1 SR-Bank thinks that cryptocurrencies will be an investment opportunity only. If there should be a form of digital currencies the bank believes that CBDC from Norges Bank can be the next

product regarding payment methods. Most of the questionnaires answered that they did not have an opinion on whether or not crypto would become the next payment method. There is a clear indicator that the public do not have a strong opinion regarding what the next payment method is, and will probably wait and see what the future brings.

#### 7.1.6 The Norwegian banks preparation

As we can see from the survey the people are expecting the banks to be the ones that have the responsibility of implementing cryptocurrencies into the Norwegian market. The responses from other local banks was that they have not started to get the necessary knowledge regarding cryptocurrencies, and were therefore not able to be interviewed.

The central bank in Norway is at the moment working on the possibility of creating CBDC which in some way will help the banking industry develop the use of digital currencies. If this project goes as planned, the banks will quickly implement the technology to be able to introduce it to their customers.

## 7.2 Collected data and theory

When we are discussing the collected data and the theory, the goal is to answer the sub-questions, leading up to the research question.

### 7.2.1 “Is there a need amongst the public for a new payment method?”

The way the payment system is today, there is not an expectation of a change of payment method. People have started to make the change of using digital money through debit and credit cards. The interviewee has also mentioned that the most known cryptocurrencies will probably not be used as a payment method. The technology behind cryptocurrencies can be used to produce a new digital currency controlled by the government, and that this will be used as a new payment method. We can conclude from the relationship people have to cryptocurrencies that there is a knowledge gap, which indicates that the need is not fully there.

When it is time for a change in payments method, the public are expecting the banking industry to be the ones that take that responsibility. This expectation connects the banks to be an



innovator or an early adopter, where they should be leading in presenting a product to the market.

### 7.2.2 “What relationship do the Norwegian banks have to cryptocurrencies today?”

The data collection shows that most Norwegian banks do not use or have a strategy around cryptocurrencies. As of what the interviewee said, the bank is watching the development of cryptocurrencies, but are not investing in the technology yet. This is an indication of the bank being an early adopter or an early majority since they are waiting for the innovation to be ready for use with the minimum of risks.

Because there is a lack of investment in the research of implementing cryptocurrencies in the banking system, they are dependent on open innovation and that the research and development can be shared with the rest. It is difficult to tell if there will be developed a technology that helps Norwegian banks with implementing cryptocurrencies. This is because from the information for the different banks, it seems like Norges Bank is the only one which is trying to create a digital currency.

By connecting the development of CBDC against the 4P model, the innovation will strike all of the elements. CBDC is first off all a product and process innovation since a new product is being produced in digital currencies, but also since the technology behind the transaction process is changing.

### 7.2.3 How are the Norwegian banking market preparing for the implementation of cryptocurrencies or Central Bank Digital Currencies (CBDC)?

As of answering the research question “*How are the Norwegian banking market preparing for the implementation of cryptocurrencies or Central Bank Digital Currencies (CBDC)?*”, it can be difficult because of the lack of research on this subject. When asking the different banks about cryptocurrencies, most of them did not have enough knowledge or constructed a strategy towards the use of cryptocurrencies. Since the global market is working with cryptocurrencies, Norwegian banks are watching them closely to be able to implement the same technology when it is shared.

There is an expectation of open innovation, where the technology around the use of cryptocurrencies and CBDC will be shared with the industry. As for now, it is Norges bank which is trying to develop CBDC and making it possible for the Norwegian banking industry to benefit from it. Since Norges Bank is the central bank in Norway, it is an expectation from the banking industry that they are the ones that are the leaders regarding development on this topic.

## 8. Conclusion and future research

In this chapter the conclusion will be presented, with a brief summary of the thesis and an answer to the research question. At the end of this chapter there will be some suggestions on future research.

### 8.1 Conclusion

This thesis focused on figuring out how the Norwegian bank prepared for implementing cryptocurrencies or CBDC. To be able to get an understanding of cryptocurrencies, a brief explanation of it and its history has been conducted. Further theories connected to the research question have been presented. By conducting an interview and a survey, we found some similarities regarding the relationship and uses of cryptocurrencies. At the end of the thesis a discussion has been conducted to connect the data collection and the theories.

In the case of answering the research question, *“How are the Norwegian banking market preparing for the implementation of cryptocurrencies or Central Bank Digital Currencies (CBDC)?”*, the Norwegian banks had to be included in the data collection. From the initial contact most banks were not able to be interviewed since they had problems with being able to answer the questions regarding cryptocurrencies. This is an indicator that the implementation of cryptocurrencies or CBDC is yet to be discussed within each bank. As for SpareBank 1 SR-Bank, there was a team watching the development of cryptocurrencies and also giving input to Norges Bank for their work on CBDC. The bank itself is not conducting too much development in the technology of cryptocurrencies.

It seems like the need for cryptocurrencies is still yet to come, seen from what participants of the survey answered. A great deal of the people have yet to get a relationship with cryptocurrencies, which can be a reason for the lack of development from the banks. But when the time comes it is expected that the banking industry is the one to have the responsibility for implementing the technology into the financial market.

## 8.2 Future research

The topic of the thesis is relatively new and it is therefore important to do further research on the uses of cryptocurrencies and central bank digital currencies. By conducting this research on the Norwegian banks, there is a hope that they will be aware of the opportunities cryptocurrencies have and that it can be beneficial to invest in the development.

This thesis is meant to be a start of research done on a bigger scale where it can include more participants and more variables. It will be more beneficial for the research paper to wait till the general knowledge of cryptocurrencies has increased. This is something the future research should have in mind.

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# Appendix

## Interview guide

I am writing my master's degree in business administration at the University of Stavanger where I specialize in strategic innovation management. In this thesis I will explore banks' approach to cryptocurrency and possible introduction of central bank digital currency (CBDC).

By implementing crypto and/or CBDC we will experience a change in possibilities and efficiency in trade and transaction between people both national and international. In the development of payment systems, we see that there is more use of digital money which can lead the way to CBDC. In this interview I want to see how the banks are working with development of technology connected to transactions and what challenges we have by implementing these types of digital money.

Questions:

1. What is your relationship with cryptocurrency?
  - a. Most people are divided of the use of crypto, whether it is a good change or if it gets easier for criminals. How does the bank work on getting crypto to become a secure payment method?
2. Why do you think there has been a slow development regarding the efficiency of payment and transactions?
3. Do you have any cooperation with other banks for the development in payment methods?
  - a. Is it important to be the first bank with this type of innovation or can it be wise to wait until there is made a model that works?
4. Today there is different types of cryptocurrencies like stablecoins, CBDC and blockchains. Is there any of these that you think will be leading in digital money?
  - a. If there are other types, do you know which?
  - b. What type of cryptocurrency do you think the banks will focus on?
5. With the use of cryptocurrency for transactions, do you think there will be made a process equal to what we have today, or are we looking at a new transaction method that will change how we do transactions?
6. What is your thought on safety regarding the use of cryptocurrency?



- a. With CBDC the state will have more control over transactions and trading with other nations, do you think it can be more beneficial with more control from the state?
  - b. With the bank's development, are you looking more at the private market or do you work towards getting CBDC?
7. In most cases of stablecoins, it is tried to get a one-to-one value with the dollar. If the stablecoin comes to Norway, do you think it will be connected to the dollar or another currency?
8. Looking at cryptocurrency you will see that the efficiency of transactions will be higher due to not having a third party to register the transaction – what will the consequences be because of this?
9. Will the bank look at cryptocurrency as an investment service like funds and stocks or do you think it can be developed to become a payment method?
- a. This is one way of development – do you think there is a possibility that cryptocurrency will start as an investment service to then become a payment method?
  - b. What is your thought on the possibility that this could work as the same as a “regular” currency?