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CHALLENGES IN ACCOUNTING FOR CRYPTOCURRENCY: A CASE STUDY OF ESTONIA

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I hereby declare that I have compiled the thesis independently
and all works, important standpoints and data by other authors
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has not been previously presented for grading.

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ABSTRACT

The purpose of the thesis is to identify the specific issues that arise when dealing with cryptocurrency from an accounting perspective in Estonia, and to evaluate the current solutions that are being used to address these difficulties. The study applies a qualitative case study approach. The author chose qualitative method, due to the novelty of cryptocurrency topic and shortage of the specialists in this area. The primary data was collected by using semi-structured interview method.

The research findings showed that the lack of clear regulations and inconsistencies in accounting methods for cryptocurrencies has presented challenges for financial professionals. Obtaining transaction information and finding qualified auditors are among the difficulties faced, and risks such as money laundering and accounting errors are prevalent. Comprehensive regulations and educational courses in cryptocurrency accounting are necessary to ensure transparent and accurate accounting practices at both national and international levels.

Keywords: cryptocurrency, blockchain technology, accounting, IFRS, bitcoin.

INTRODUCTION

Over the past few years, cryptocurrencies have gained a significant presence in the global financial system. These digital assets operate without the need for intermediaries such as banks or governments, thanks to the underlying technology called blockchain. Thousands of new cryptocurrencies have recently emerged and today, they are increasingly being used in businesses of all sizes.

Cryptocurrencies have numerous advantages, such as decentralisation, security, anonymity, and faster transactions. However, they also pose challenges, including volatility, regulatory uncertainty, and potential for illicit activities. Despite the challenges associated with cryptocurrencies, they continue to gain popularity in various industries, including finance, real estate, and technology.

Cryptocurrency is a relatively new asset, and traditional accounting standards and regulations do not address the unique characteristics of cryptocurrencies. Cryptocurrencies can be classified as financial instruments, intangible assets, or inventories, depending on their intended use. Each classification comes with its accounting requirements, and businesses need to determine which one applies to their specific situation. As more businesses begin to incorporate cryptocurrencies into their financial operations, they need to account for it accurately and transparently to comply with regulatory requirements and to provide reliable financial information to stakeholders.

The topic of cryptocurrency accounting was chosen due to its topicality and novelty. In Estonia, the difficulties faced by businesses are similar to those faced globally Working in a company that deals with cryptocurrency accounting, the author of the thesis has first-hand witnessed challenges and complexities associated with accounting for cryptocurrencies. The author believes that more research shall be done to identify the particular problems that accountants and other specialists responsible for preparing financial information face when dealing with crypto assets. As the field of crypto assets is constantly evolving, the author decided to focus on cryptocurrencies and only investigate them in the research. The purpose of this thesis is to identify the specific issues that arise when dealing with cryptocurrency from an accounting perspective, and to evaluate the current solutions that are being used to address these difficulties. The study investigates the experience of experts from the field of accounting and answers the following research questions:

1. What are specific challenges that people responsible for preparing financial information face when dealing with cryptocurrency in Estonia?
2. What are the current accounting methods and solutions for handling cryptocurrencies?
3. What are the potential risks associated with accounting for cryptocurrencies, and how can these risks be mitigated through appropriate accounting practices?

The thesis utilises qualitative research, specifically semi-structured interviews, due to the limited knowledge on cryptocurrency accounting in Estonia. The interviews were conducted with accountants and financial information preparers in Estonia, with questions formulated based on the research aim and questions. Four individuals were initially sought for the interviews, but one was unable to participate, resulting in only three interviews being analysed.

The thesis consists of three different chapters. The first chapter covers the theoretical foundations, introducing the concept of blockchain technology and cryptocurrency. The evolution of cryptocurrency is then examined, starting with the introduction of Bitcoin as the first cryptocurrency, followed by further development and expansion of the concept. The chapter also covers the classification of cryptocurrency and the advantages and concerns surrounding its adoption. The second chapter introduces an overview of current accounting solutions for cryptocurrency based on the International Financial Reporting Standards (IFRS). The chapter examines each of these classifications in more detail, including the relevant accounting methods and requirements. The third chapter presents the selected methodological approach to the research and procedures for data collection. The analysis and findings of the research are presented in the final section of the chapter, providing insights into the difficulties faced by financial professionals in accounting for cryptocurrency, as well as the associated risks. The final chapter ends with findings and limitations of the research and also discusses possible future research opportunities.

1. BLOCKCHAIN TECHNOLOGY AND CRYPTOCURRENCY

The modern economy's distinguishing feature is a rapid development of its virtual sphere, the growing role and penetration of digital technologies into the real sector. The use of cryptographic tools is an important attribute of the virtualisation and digitalisation of the economy. (Brukhanskyi & Spilnyk, 2019) One of the most significant developments in the digitalisation of the economy has been the emergence of blockchain technology. According to Pugna and Duţescu (2020), there is no doubt that blockchain is currently one of the most talked-about and highly sought-after technologies, with immense potential to bring about significant changes in the daily lives. It has the power to disrupt traditional industries and transform the way business is conducted.

1.1 Understanding blockchain technology

In 2008, a person or a group of people who identified themselves as Satoshi Nakamoto introduced the idea of blockchain. The technology was originally designed as the backbone of the cryptocurrency, Bitcoin (BTC), to facilitate secure, decentralised transactions without the need for intermediaries such as banks or other financial institutions (Nakamoto, 2008).

A distributed computer network called a blockchain is created and maintained by software. Blockchain is a computerised and distributed ledger that measures and preserves financial transactions that employs cryptocurrency. (Sheikh *et al*., 2019) A blockchain consists of a chain of blocks, with each block containing a set of transactions. Each block is linked to the previous block using cryptographic algorithms, forming a chain of blocks, hence the name "blockchain". When a block is appended to the chain, it is impossible to modify or delete it, which guarantees the accuracy and reliability of the transaction records. (Sarmah, 2018)

As stated by Antonopoulos (2014), the security of a blockchain is maintained through a consensus mechanism, which involves a network of computers verifying the transactions and ensuring that they comply with predefined rules. Once the transactions are validated, they are added to the blockchain, and a reward is given to the computer that verifies the transactions. The process is called mining, and it guarantees the blockchain stays secure and reliable.

According to PwC' "Time for trust" report (2020), over the next ten years, blockchain technology has the potential to boost the global GDP by 1.76 trillion USD. However, due to its novelty, the implementation of blockchain technology can challenge established economic laws and demand radical changes in business processes (Brukhanskyi & Spilnyk, 2019).

1.2 Evolution of cryptocurrency

Cryptocurrencies are forms of digital money that work on decentralised systems based on blockchain technology and can be used through electronic wallets that may be software or hardware based (Teichmann & Falker, 2020). Although cryptocurrencies were initially designed to be an alternative to traditional currencies, their decentralised nature makes them unsuitable for use as a legal tender, as stated by Nakamoto in 2008.

1.2.1 Bitcoin: first cryptocurrency

Bitcoin, which was the pioneer in the world of cryptocurrencies, has gained widespread recognition and is currently the most commonly traded digital currency. As noted by Guadamuz and Marsden (2015), the value of Bitcoin is determined by the users, and it is managed using an open-source software that can be installed on any computer or mobile device. This means that Bitcoin is not a government-issued currency and is operated solely by its users.

In the beginning of 2009, Nakamoto was responsible for mining the first block of Bitcoin, which is also known as the "genesis block". Shortly after, Nakamoto sent the very first Bitcoin transaction to Hal Finney, who was also a developer. (Worldcoin, 2022) One year later, the initial tangible purchase using Bitcoin took place. Laszlo Hanyecz ordered two pizzas from Papa John's for 10 000 BTC, which at the time was equivalent to about 25 USD. If this transaction had occurred during the peak of Bitcoin's pricing in 2021, the same pizzas would have been valued at an astonishing 630 million USD. (Pinkerton, 2023)

Bitcoin's value did not experience a significant surge until 2011, when Forbes published an article about it. In this article Forbes mentioned that the value of Bitcoin "jumped from half a penny in value to about a dollar" (Greenberg, 2011). Following the release of the article, Bitcoin's value

reached an all-time high of almost 9 USD per coin, which was a substantial increase from its previous trading price. (Worldcoin, 2022)

Bitcoin's success paved the way for the emergence of the concept of decentralised digital currencies, leading to the gradual acceptance of the idea. As a result, the first alternative cryptocurrencies began to emerge, which were referred to as altcoins as they provided an alternative to the established Bitcoin cryptocurrency. (Kriptomat, n.d.)

1.2.2 Further development

After the creation of Bitcoin, a number of other cryptocurrencies emerged. Litecoin was the first, created in 2011 by Charlie Lee, a former Google engineer. It was designed to be faster and more efficient than Bitcoin, and it used a different algorithm for mining. Other cryptocurrencies that followed include Namecoin, Peercoin, and Ripple. (Crosby *et al.*, 2016)

In 2015, Ethereum was introduced, which was a significant milestone in the history of cryptocurrency. It has since become the second-largest cryptocurrency by market capitalisation (CoinMarketCap, 2023). Ethereum introduced the concept of smart contracts, which enabled the creation of decentralised applications. It also introduced the use of a programming language, which allowed developers to build their own applications on the Ethereum blockchain. (Swan, 2015)

There are no indications that the expansion of cryptocurrencies is slowing down. In addition to the existing cryptocurrencies, there are also new cryptocurrencies being introduced on a regular basis through initial coin offerings (ICOs) (PwC, 2018). According to a report by the Cambridge Centre for Alternative Finance (2020), there were 101 million cryptocurrency users globally in 2020 compared to 35 million in 2018, representing a staggering 189% growth. This growth is likely to continue, as the benefits of cryptocurrencies become more widely recognised.

One factor driving the expansion of cryptocurrency is the increasing acceptance of digital payments. In a survey conducted by Mastercard (2021), 67% of respondents said that they are more open to using a cryptocurrency than they were in 2020. This represents a significant shift in consumer behaviour. In fact, major companies such as Tesla, Amazon, and PayPal have started accepting cryptocurrencies as a form of payment, further legitimising them (Walsh, 2021).

Another factor contributing to the expansion of cryptocurrency is the growing interest from institutional investors. According to a survey by Fidelity Digital Assets (2021), 70% of institutional investors are planning to invest in digital assets in the near future.

1.3 Classification of cryptocurrency

Cryptocurrencies can be classified into seven broad categories based on their characteristics and underlying technology (Härdle *et. al.*, 2020):

1. *Transaction mechanism* refers to the process by which transactions are initiated, verified, and recorded on the blockchain. The original intention behind Bitcoin's design was to serve as a transaction mechanism, making it a member of the first category of cryptocurrencies.
2. *Distributed computation tokens* are cryptocurrencies that enable the execution of computer programs or smart contracts on a decentralised network. The Ethereum network allows for the execution of computer programs, known as smart contracts. It can be compared to an internet computer where simple programs are called upon and run when needed. Other cryptocurrencies that fall under this category include Tezos, EOS, and DFinity.
3. *Utility tokens* are designed to provide access to a particular product or service. They are used as a form of payment within a specific ecosystem or platform. Filecoin, Binance Coin, and Basic Attention Token are examples of utility tokens.
4. *Security tokens* utilise blockchain technology to provide investors with a secure and transparent way of investing in assets, such as commodities, real estate, or equity. These tokens represent ownership of the underlying asset and are backed by the blockchain ledger. Some examples of security token platforms include Polymath, Harbor, and Swarm.
5. *Fungible tokens* are interchangeable with one another and have equal value; the most well-known fungible token is issued on the Ethereum blockchain and called ERC-20. A small amount of a cryptocurrency like Ethereum (ETH) can stand in for something else that is more valuable because to fungible tokens. For example, a company could issue fungible tokens that represent shares of their company or a certain amount of a commodity (gold).
6. *Non-fungible tokens* are unique digital assets that cannot be replaced or exchanged for another. Ethereum's ERC-721 protocol is a popular standard for creating NFTs. Dharma debt agreements are an example of an NFT that falls under this category. Other examples of NFTs include Cryptokitties and Decentraland's LAND, which are unique digital collectibles and virtual real estate, respectively.

7. *Stablecoins* are cryptocurrencies that are pegged to a stable asset such as the US dollar or gold. They aim to provide the benefits of cryptocurrencies such as speed and security while eliminating the volatility associated with traditional cryptocurrencies. Tether, USD Coin, and TrueUSD are examples of stablecoins.

The seven-category taxonomy used to classify cryptocurrencies is not an exhaustive list, as there are various other cryptocurrency concepts that do not neatly fit into any of these categories, such as Facebook's Diem or Overlay. The cryptocurrency market is continually evolving, and new innovations and concepts are being developed all the time.

1.4 Main advantages of cryptocurrency

As stated by Rice (2019), cryptocurrency's anonymity allows easy access for anyone to set up a digital wallet and participate in purchasing and trading. Its simplicity allows for quick money flow, with transactions taking only a few minutes or seconds. Cryptocurrency simplifies intercontinental and long-distance transfers, without restrictions on recipients or transaction amounts. Unlike conventional money wiring, there are no holds on large transactions, making it a unique avenue for businesses and individuals who need to move large sums of money quickly and effectively. Moreover, in cryptocurrency transactions, the fees charged are generally low. Unlike in banking, where multiple fees are imposed for transactions, currency transfers, accounts, and database management, cryptocurrency operations are significantly lower in costs. (Zakarneh *et al.*, 2022)

Transparency is a fundamental characteristic of the cryptocurrencies. The blockchain, a sequential chain of blocks, stores information about every transaction that has occurred, thus preserving a comprehensive history. The transparency of blockchain technology enables users to track live transfers through the use of blockchain explorer, which is available on the platform. The decentralised nature of blockchains also ensures that this system is free from corruption, which is a source of comfort for investors. (Tambe & Jain, 2023)

Another noteworthy characteristic of cryptocurrency is that there is no inflation. The total number of coins in circulation is usually limited, with no possibility for political or corporate intervention to change this order. For example, the maximum limit of BTC is exactly 21 million, and it was set by Satoshi Nakamoto, the creator of Bitcoin in 2008. The crypto operations take place in a peer-to-peer cryptocurrency network, wherein exchange of information, or in this case, money, occurs

between two or three or more software clients. Transactions are conducted by a vast network of distributed servers, making it impossible for banks, taxes, or governments to regulate the exchange of money. (Bunjaku *et al.*, 2017)

Stoica (2021) claims that one of the main advantages of cryptocurrency is the diverse range of payment methods available to users. As the number of cryptocurrency users continues to grow, so too does the demand for this payment system. This is particularly advantageous for sellers who choose to accept cryptocurrency payments, as it provides them with a competitive edge in the market. By accepting cryptocurrency payments, sellers can attract a wider range of customers who prefer to use digital currencies as a payment method. This not only increases their customer base but also enables them to tap into new markets and expand their reach globally. Furthermore, the use of cryptocurrency as a payment method is particularly appealing to tech-savvy consumers who value speed, convenience, and security when making transactions.

1.5 Main concerns about cryptocurrency adoption

The expansion of cryptocurrencies has led to both excitement and concern. Proponents of cryptocurrencies argue that they offer a more secure, transparent, and efficient way of conducting transactions, while also providing a way to bypass traditional financial institutions (Nakamoto, 2008). Critics, however, point to the high volatility of cryptocurrencies, their potential use in illegal activities, and the lack of regulation in the industry (Böhme *et al.*, 2015).

Cryptocurrencies have experienced significant price swings, with some currencies losing or gaining value by as much as 50% or more in a single day (CoinMarketCap, 2023). This volatility has made it difficult for businesses to accept cryptocurrencies as payment, as they may not be able to accurately predict the value of their holdings. Consumers and businesses are hesitant to use cryptocurrencies for transactions, as the value of the cryptocurrency could change dramatically between the time of the transaction and the time it is received. (Klein *et al.*, 2018)

Over the years, several high-profile cyber-attacks have targeted cryptocurrency blockchains. One of the earliest and most impactful attacks occurred over a decade ago, but its effects are still felt in the crypto space today. A well-known Japanese cryptocurrency exchange called Mt. Gox formerly had control over 70% of all bitcoin trades worldwide. However, unbeknownst to the

company and its clients, hackers had been stealing funds for years. The attackers were successful in stealing 840 000 BTC between 2011 and 2014, which was worth over 450 million USD at the time and tens of billions presently. This led to Mt. Gox declaring bankruptcy in February 2014, and its customers lost their coins permanently. (Arctic Wolf, 2022)

Due to the significant amounts of digital currency involved, cryptocurrency exchanges, platforms, and personal wallets are attractive targets for cyber-attacks. As a result, these entities are at a higher risk of being targeted by malicious actors seeking to gain unauthorised access to digital assets or disrupt their operations. From June 2021 to June 2022, hackers exploited unsecured wallets, SIM card jacking, or stole recovery phrases and passwords, causing crypto platforms to lose an estimated 44 billion USD. The FBI has identified cryptocurrency ATMs as a current favourite of crypto scammers, with approximately 1500 cases of crypto ATM fraud in 2021, resulting in losses of 28 million USD. State-sponsored criminals also regularly target crypto firms and use stolen funds to finance terrorist activities and war crimes. (Sjouwerman, 2022)

The environmental impact of cryptocurrency mining has also emerged as a challenge. The process of mining cryptocurrencies requires significant amounts of energy, which has led to concerns about the environmental impact of the industry. According to Cambridge Bitcoin Electricity Consumption Index (2023), the amount of energy consumed by cryptocurrency exceeds that of entire countries like Philippines and the Netherlands. Bitcoin's power consumption can push global warming beyond 2°C (Mora *et. al*., 2018). According to another study, the process of Bitcoin mining in China could produce 130 million metric tons of CO2 by 2024. This amount could increase even more if more mining activities move to other countries, such as the U.S., unless the use of renewable energy is increased. (Jiang *et.al*., 2021)

The quick rises in value and volatility of cryptocurrencies have recently sparked significant interest and regulatory scrutiny across numerous jurisdictions. Cryptocurrencies have received minimal attention in accounting literature around ten years ago. In the beginning of 2014, the Financial Accounting Standards Board (FASB) search engine returned the message "Sorry, no results found for the search criteria you entered" when someone searched for "Bitcoin". (Raiborn & Sivitanides, 2015) However, as of 2023, there are more than 20 000 cryptocurrency projects besides Bitcoin with a total market cap of 952 billion USD (Tretina & McGimpsey, 2023). As a result, the accounting treatment of cryptographic assets has become an important issue for businesses and regulators alike. (PwC, 2019) The impact of blockchain technology is twofold – it is likely to

influence how accounting transactions are documented and validated, including by auditors. Moreover, as cryptocurrencies are used in day-to-day business operations, they must be accounted for and reflected in financial accounts. Nevertheless, the slow delivery of accounting guidelines by accounting standard-setters remains a challenge as they catch up with this new phenomenon. (Procházka, 2018)

Estonia, being one the most favourable countries in terms of business environment, has utilised blockchain technology since 2008. According to the Financial Intelligence Unit, there were 453 valid licenses for virtual currency service providers in Estonia as of March 26, 2021 (Rahapesu Andmebüroo, 2021). It, in turn, means the businesses operating or willing to open a company in Estonia are interested in this area. However, despite the interest in cryptocurrencies and blockchain technology, there are still many challenges that companies face when entering the cryptocurrency business. One of them is accounting for cryptocurrencies. Cryptocurrencies are a relatively new asset class, and traditional accounting methods may not fully capture their unique features, as it was already mentioned before. Due to the lack of accounting standards on the international level, the accountants and other people responsible for preparation of financial information in Estonia, have varying interpretations of how cryptocurrencies should be accounted for, resulting in inconsistencies in reporting.

2. OVERVIEW OF CURRENT ACCOUNTING SOLUTIONS

As noted by Luo and Yu (2022), the current guidelines established by Generally Accepted Accounting Principles (GAAP) and International Financial Reporting Standards (IFRS) do not sufficiently cover many aspects of cryptocurrency that result from novel transaction types. Despite some accounting and auditing firms providing practice guidelines on how to handle digital assets in accordance with GAAP, there are still no explicit regulations regarding the accounting treatment of cryptocurrency. This creates complex challenges for those responsible for preparing financial information, as the nuanced and continually developing characteristics of the cryptocurrency phenomenon require a thorough understanding of existing accounting standards to find the best accounting method, as highlighted by Sixt and Himmer (2019).

Estonian companies must comply with the accounting principles and presentation formats required by law. According to the Estonian Accounting Act, companies have the option to prepare their annual and consolidated accounts using either the Estonian Accounting Standards (Estonian GAAP) or IFRS (RPS §17). However, neither of these accounting standards have specific rules for accounting or disclosure of crypto assets, including cryptocurrency.

2.1 Classification of cryptocurrency according to IFRS

The reason for holding cryptocurrency can vary among entities, and even within different business models of the same entity. To ensure the proper accounting approach, an organisation must follow the primary principle of providing valuable financial information. The significance of an item that an entity procured is not crucial for reflecting its financial status and accomplishments, but rather the reason behind the acquisition. (Procházka, 2018) There have been varied opinions on which IAS (International Accounting Standards) to use when recording ownership of digital currencies. These approaches involve categorising the holding of digital currencies as either cash or cash equivalents, financial instrument, inventory, or intangible assets. (Venter, 2018)

2.1.1 Cash and cash equivalents

Although the term “cryptocurrency” implies that it is a type of currency, it does not necessarily mean that it qualifies as cash or its equivalent for accounting purposes. According to the IFRS,

cash is defined as “cash on hand and demand deposits” (IAS 7 (6), 1992). This includes banknotes and coins, as well as balances held in bank accounts that are available for immediate withdrawal without any significant restrictions. While more organisations are starting to accept digital currencies as payment, they are not yet commonly used as a means of exchange and are not considered as an official currency. (Association of Chartered Certified Accountants, n.d.)

Despite initiatives to encourage financial inclusion, there has been a slow uptake of cryptocurrencies as a form of payment or remittance, and they are unlikely to be utilised by marginalised or unbanked individuals. Even though certain cryptocurrencies may be recognised as legal tender, they are not regarded as a feasible medium of exchange. (Alvarez *et al*., 2022) In contrast, currency (cash) is regarded as a financial asset since it acts as a medium of exchange and serves as a basis for measuring and recognising transactions in financial statements (IAS 32 (AG3), 2003).

Investments that can be quickly converted into known sums of cash are known as cash equivalents. They have a short-term maturity, high liquidity, and carry an insignificant risk of value changes. (IAS 7 (6), 1992) Cryptocurrencies cannot be considered as cash equivalents because their value is highly volatile, and they do not a have maturity date. Therefore, they do not meet the criteria of being cash equivalents and cannot be accounted for in compliance with IAS 7.

2.1.2 Financial instruments

Financial instruments refer to resources that a company possesses in the form of cash, securities, and financial obligations that generate income. This may consist of cash, amounts owed to the company by its customers, and both short-term and long-term investments. (Xolmirzaev, 2020) Paragraph 11 of IAS 32 defines a financial asset as “any asset that is: (a) cash; (b) an equity instrument of another entity; (c) a contractual right to receive cash or another financial asset from another entity; (d) a contractual right to exchange financial assets or financial liabilities with another entity under particular conditions; or (e) a particular contract that will or may be settled in the entity’s own equity instruments” (IAS 32 (11), 2003).

However, it was concluded during a meeting of the IFRS Interpretations Committee in June 2019 that cryptocurrency holdings do not qualify as financial assets since they do not meet the criteria

of cash or an equity instrument, nor do they provide contractual rights or settlements in the holder's equity instruments. (IFRS Interpretations Committee, 2019)

Lapiņkaia & Leahovcenco (2020) note that the defining characteristic of a financial asset is the holder's contractual right to receive cash or another financial asset from another entity, or to exchange financial assets or liabilities on favourable terms, which is generally not the case with cryptocurrency holdings. This point of view is supported by EY in their publication that considers the accounting of crypto assets. According to their perception, certain types of cryptocurrency arrangements, such forward contracts or options to buy or sell cryptocurrencies in the future, may fit the definition of a derivative and be subject to accounting norms for financial instruments. However, holdings in cryptocurrencies do not often meet the definition of financial assets since they do not grant any contractual rights to receive money or other financial assets from another party or to exchange financial assets or liabilities on potentially favourable terms. Therefore, whether cryptocurrency can be accounted for as derivatives in financial assets depends on the specific characteristics and terms of the related agreements. (EY, 2021)

2.1.3 Inventories

Depending on an entity's business model, it could be appropriate to account for cryptocurrencies under IAS 2 "Inventories" (Grant Thornton, 2018). The inventories can be defined as "assets (a) held for sale in the ordinary course of business; (b) in the process of production for such sale; or (c) in the form of materials or supplies to be consumed in the production process or in the rendering of services" (IAS 2 (6), 2005).

In accordance with IAS 2, if a company holds cryptocurrencies for the purpose of sale in the normal course of business, they may be classified as inventory. However, if the company is functioning as a broker-trader of cryptocurrencies, then the inventory should be measured at fair value less any costs associated with selling it. This type of inventory is acquired with the purpose of generating profit from price fluctuations or broker-traders' margins. Therefore, this valuation method is applicable only in limited circumstances where the business model involves selling cryptocurrency with the aim of generating profit from price fluctuations. (Association of Chartered Certified Accountants, n.d.)

The mining of cryptocurrencies also falls under the category of "Inventories" in accounting, as stated by Procházka (2018). As per this perspective, the accounting treatment for cryptocurrencies obtained through mining should adhere to the principles outlined in IAS 2, which focuses on the cost of conversion. This involves the systematic allocation of fixed and variable production overheads spent in the process of transforming raw materials into completed items, as well as direct expenses associated with the units of production. However, determining the production costs can be challenging because mining is a competitive process where only the winner receives the cryptocurrency reward, and the expenses incurred during unsuccessful mining attempts are considered as waste and need to be expensed immediately.

2.1.4 Intangible assets

One could argue that the most notable characteristic of cryptocurrency is its lack of physical existence. Therefore, when determining how to classify cryptocurrencies based on their physical nature, one of the options is to view them as intangible assets since they have no physical form. However, simply being intangible is not sufficient for cryptocurrency to be recorded as an intangible asset according to accounting and financial reporting standards. In essence, not having a physical form does not automatically qualify cryptocurrency to be recognised as an intangible asset. (Büyükkurt, 2021)

According to the International Accounting Standards, the intangible assets are "identifiable non-monetary assets without physical substance" (IAS 38 (8), 2004). The term "identifiable" is explained in the same accounting standard and defined as "if it either: (a) is separable, i.e., is capable of being separated or divided from the entity and sold, transferred, licensed, rented or exchanged, either individually or together with a related contract, identifiable asset or liability, regardless of whether the entity intends to do so; or (b) arises from contractual or other legal rights, regardless of whether those rights are transferable or separable from the entity or from other rights and obligations." (IAS 38 (12), 2004)

The possession of cryptocurrencies can be exchanged either through an exchange platform or through transactions between individuals, and hence satisfies this aspect of the definition. The absence of a physical form is another requirement for an intangible asset to be recognised. It can be easily identified that cryptocurrency does not have any physical existence and thus meets this requirement. In terms of whether cryptocurrencies are monetary or non-monetary, the monetary

assets are described as “money held and assets to be received in fixed or determinable amounts of money” in the IAS 38 (8) (2004). Since they do not fit this description, cryptocurrencies can be categorised as non-monetary assets.

The IFRS Interpretations Committee stated that a cryptocurrency holding fulfills the definition of an intangible asset under IAS 38 because it can be separated from the holder and sold or transferred individually, and it does not provide the holder with the entitlement to receive a fixed or determinable number of currency units. (IFRS Interpretations Committee, 2019) Grant Thornton (2018) also supports that the cryptocurrency is a type of digital currency without any physical form, and in most instances, labelling them as intangible assets would be the most suitable categorisation.

At the same time Procházka (2018) argues that even though cryptocurrency meets the technical definition of an intangible asset as per IAS 38, it lacks the economic attributes of an intangible asset that were taken into account when formulating this standard.

2.1.5 Other considerations

Management must exercise judgement to develop and implement an accounting policy that delivers information that is both pertinent to users’ economic decision-making and reliable when no explicit IFRS rule applies to a transaction, event, or condition. However, this policy must comply with the general principles outlined in IFRS, such as the principles of faithful representation, substance over form, neutrality, prudence, and completeness. (IAS 8 (10), 2003)

The current accounting solutions for cryptocurrencies are still in their early stages and face significant challenges due to the lack of specific regulations and guidelines established by GAAP and IFRS. The nature of cryptocurrency makes it challenging to fit them into any of the current categories. As cryptocurrencies can serve multiple purposes, they can fall under various categories such as financial instruments, inventories. However, due to their unique characteristics, they can also be classified as intangible assets, which can create a discrepancy in their representation in financial statements. As a result, accounting and auditing companies have to take over the responsibility and process cryptocurrency transactions and operations based on the recommendations or general understanding on how it should be done. This process implies

liability, and while the biggest accounting and auditing providers have developed certain guidelines for their employees, small companies have to keep up with the times on their own.

As the use of cryptocurrencies continues to grow, it is indeed essential to understand the potential difficulties that arise when dealing with this type of assets, despite classification issues and concerns about adoption of cryptocurrency in the current business setting. The accounting industry needs to be equipped with the knowledge and tools necessary to properly account for these assets. The practical part of the thesis aims to shed light on the challenges faced by accountants in Estonia when accounting for cryptocurrencies and to identify potential solutions to these challenges.

3. RESEARCH METHODOLOGY AND FINDINGS

This chapter comprises a description of the research methodology chosen for the study, as well as an analysis of the findings. The chapter concludes with a summary of the conclusions and discusses the limitations of the research and possible future research opportunities.

3.1 Research methodology

The methodology employed in this thesis is based on qualitative research, specifically utilising a case study approach. As introduced before, this research aimed to identify the specific issues that arise when dealing with cryptocurrency from an accounting perspective, and to evaluate the current solutions that are being used to address these difficulties.

The author chose qualitative method, specifically semi-structured interview, since the topic of crypto assets is novel and there are few people in Estonia who have in-depth knowledge of the cryptocurrency accounting. The primary advantage of using qualitative research is its capacity to prioritise descriptive and interpretive elements (Given, 2008, pp. 68-69). In addition, the quantitative research is conducted to interpret and descript individuals' opinions and perception. As the main aim of the thesis refers to the identification of specific issues and valuation of current solutions, it is important to understand and take into consideration different views to the problem. To achieve the aim, the thesis focuses on the following research questions:

1. What are specific challenges that people responsible for preparing financial information face when dealing with cryptocurrency in Estonia?
2. What are the current accounting methods and solutions for handling cryptocurrencies?
3. What are the potential risks associated with accounting for cryptocurrencies, and how can these risks be mitigated through appropriate accounting practices?

3.2 Data collection

The author chose the interviewees based on their experience in handling cryptocurrency assets in Estonia. The selection criteria were individuals who had experience with cryptocurrency, worked in accounting or financial reporting roles, and were willing to participate in the study. The author contacted the interviewees via email, providing them with information about the study's purpose and the interview process. The author explained that the interviews would be confidential and that their participation was entirely voluntary. The interviewees who agreed to participate were asked to provide their availability for scheduling the interviews. After the author received the interviewees' confirmation of their availability, the interviews were scheduled at a convenient time and location. Two interviews were conducted in person, and one was conducted online, using the Zoom platform. The language of the interviews was either Russian or English, depending on the interviewee's preference.

The interviews were conducted within the accountants and people responsible for preparing financial information only in Estonia, since the thesis focuses on challenges in Estonia. The questions for the interview were formulated taking into account the research aim and questions of the thesis. The questions that author used during the interviews are presented in Appendix 1. The interview transcripts have been kept confidential in order to protect the anonymity of the participants. The aim was to gather insights from four individuals with experience in handling crypto assets, however, due to unforeseen circumstances, one interviewee was unable to participate, resulting in analysis from only three interviews being presented in the thesis. All the interviewees agreed that the interview could be recorded to give the researcher access to the interviews later. The author interviewed the Chief Accountant at Accountex, who has more than 15 years of experience in accounting, Financial Controller at Breakwater Technology with around 15 years of experience in accounting and audit and Head of Business Process Solutions and Head Accountant at Grant Thornton, one of the leading pan-Baltic providers of audit, accounting and advisory companies.

3.3 Analysis of collected data

Once the author transcribed the interviews, the analysis and findings were presented. The interview transcripts were presented on an external server, and they were made available to the Defence

Committee members separately (Appendix 2). The author analysed the interviews using a thematic analysis approach. The author reviewed the transcripts several times, identifying the main themes and patterns that emerged from the data. The themes were grouped into categories that related to the research questions and objectives. The analysis aimed to identify the challenges and risks that accountants face when handling cryptocurrencies, the current accounting practices for cryptocurrencies in Estonia, and the potential solutions to the identified challenges.

3.3.1 Challenges in accounting for cryptocurrency

During interviews with accounting professionals responsible for preparing financial information, a common concern that was raised was the lack of clarity regarding cryptocurrency accounting at the state level. Professionals are ought to rely on their general knowledge and practices, resulting in various accounting methods being used by different enterprises.

The Financial Controller at Breakwater Technology suggests that companies actively involved in cryptocurrency trading should account for it as inventory or intangible assets for long-term investments. In rare cases the cryptocurrencies fit the criteria of financial instruments and may be considered a prepayment when something is promised in return for a token. This point of view is close to the statement of EY (2021), where they claim that whether cryptocurrency can be considered financial instrument or not depends on the specific characteristics and terms in an agreement between the vendor and vendee. The Chief Accountant of Accountex believes the correct way to account for cryptocurrency is through inventory. However, if a company is only engaged in investments and buys crypto assets for the purpose of further resale, then is shall be put on short-term investments account. At the same time the Head Accountant at Grant Thornton insists that cryptocurrencies should be reflected in financial statements through inventory or fixed assets accounts, and intangible assets can only be used for tokens or in case when the companies are involved in the development of their own cryptocurrency.

The lack of clear regulations on cryptocurrency accounting has caused confusion and inconsistencies in accounting methods used by financial professionals. While various approaches have been proposed, inventory accounts are commonly suggested. This is also confirmed by the Association of Chartered Certified Accountants (n.d.), who claimed the inventory account can be used when the business model of a company involves selling cryptocurrency with the aim of generating profit from price fluctuations.

One of the main challenges in preparing financial information for cryptocurrency clients is obtaining information about transactions. Obtaining detailed statements is only possible from the largest crypto exchanges and wallets (such as Kraken and Binance) and in most cases accountants still have to transfer the information to the accounting software making manual amendments. In addition, the high volume of transactions, with some clients having up to ten transactions per second, further complicates the tracking and bookkeeping process. However, with the advent of cryptocurrencies, specialised software has emerged that provides businesses with the ability to gain more precise insights into their transactions and sort them effectively. These programs are designed to facilitate cryptocurrency management, automatically tracking and organising transactions from a variety of exchanges and wallets and thus making them easier to account for.

Another significant difficulty in cryptocurrency accounting is communication with clients. Despite the increased responsibility involved in crypto accounting, clients often refuse to provide necessary information about their crypto transactions. Suspicions and inquiries regarding these transactions are frequently met with hostility, and some clients believe that transactions made with cryptocurrency should not be reflected in accounting at all. Furthermore, business owners may change the purpose of their cryptocurrency purchases without informing their accountants, leading to further complications in accurate financial reporting.

Finding a qualified auditor for companies dealing with cryptocurrency is also a challenge. All interviewees agreed that auditors are hesitant to work with crypto companies due to the added responsibility involved. In Estonia, the number of auditors willing to work with crypto companies is limited to only around 30 to 40 specialists, while the number of entities requiring an audit is much higher, creating a significant shortage of qualified auditors for these companies.

3.3.2 Risks associated with cryptocurrency accounting

In addition to the challenges that people responsible for preparing financial information face, there are certain risks associated with accounting for cryptocurrencies. The most common risks that were mentioned during the interviews include money laundering, fraud and lack of transparency. These risks stem from the decentralised nature of cryptocurrencies and can only be addressed through proper legislation at both international and national levels. In order to ensure transparent and accurate accounting, small accounting providers check the big incoming and outgoing

transactions using external help of anti-money laundering screening tools, such as AMLBot. Bigger companies, in addition, make a full screening, review white papers and investigate whether the clients have to apply for a license to operate in Estonia.

Another comment concerns incorrect representation of cryptocurrency transactions which can result in accounting errors, requiring accountants to make changes to financial statements and declarations. For example, if a transaction is initially recorded as a loan but later must be corrected to reflect income, accountants may be forced to change the declarations and the financial statements of a company. To address the issue of incorrect representation of cryptocurrency transactions, it is essential to establish proper accounting and reporting procedures. The Chief Accountant at Accountex suggests that educational courses in cryptocurrency accounting could benefit current accounting providers. Normative acts currently do not provide comprehensive information, leading to varying interpretations. A standard framework would eliminate confusion and prevent deviations, making accounting for cryptocurrency more manageable. Grant Thornton's Head of Business Process Solutions predicts that the popularity of crypto transactions will eventually settle down to levels similar to the stock market within the next five years.

One of the interviewees also mentioned that there is a high risk of fluctuations of the cryptocurrencies, which may result in big losses for a client. Unfortunately, all investments, including crypto assets, are subject to market risk, so there is no possibility to mitigate this risk.

3.4 Findings and limitations of the research

The lack of clear regulations on cryptocurrency accounting has caused confusion and inconsistencies in accounting methods used by financial professionals. While various approaches have been proposed, inventory accounts are commonly suggested. One of the main challenges in preparing financial information for cryptocurrency clients is obtaining information about transactions. Furthermore, clients often refuse to provide necessary information about their crypto transactions. Finding a qualified auditor for companies dealing with cryptocurrency is also a challenge. In addition to the challenges that people responsible for preparing financial information face, there are certain risks associated with accounting for cryptocurrencies. The most common risks that were mentioned during the interviews include money laundering, fraud, and lack of transparency. Another comment concerns incorrect representation of cryptocurrency transactions

which can result in accounting errors, requiring accountants to make changes to financial statements and declarations. To address these issues, it is essential to establish proper accounting and reporting procedures. Overall, there is a need for comprehensive regulations on cryptocurrency accounting at the national and international levels. In addition, there is a need for educational courses in cryptocurrency accounting for current accounting providers to ensure transparent and accurate accounting.

It must be mentioned that this research has some limitations that need to be acknowledged. Firstly, due to Estonia's lack of expertise in cryptocurrency accounting at the time of data collection, it was challenging to find accountants and other specialists dealing with cryptocurrency reporting. This led to a relatively small sample size, as only a few individuals consented to participate in the interviews. Additionally, the research solely considers cryptocurrencies and ignores other crypto asset classes, which can present different difficulties. Moreover, since the study only examines Estonia's experience with cryptocurrency accounting, thus the results might not apply to other nations or areas. Therefore, the results should be interpreted with caution and should not be generalised to other contexts without careful consideration of the specific circumstances.

Despite the limitations of this study, the conclusions and proposals presented in the paper hold implications for the accounting industry in Estonia and beyond. With the increasing popularity of cryptocurrencies, it is essential for accountants to have the knowledge and tools to properly account for these assets. The study has highlighted the challenges and potential solutions related to cryptocurrency accounting in Estonia. Although further research is necessary to comprehend the impact of blockchain technology on the accounting industry, this study provides an excellent starting point for future investigations.

The future research, however, could involve conducting a questionnaire among a larger group of accountants to obtain a broader understanding of their experiences and perspectives related to cryptocurrency accounting. Increasing the number of interviewees could also provide more comprehensive insights into the challenges faced by accountants in Estonia and beyond. Moreover, future research could investigate the accounting difficulties associated with other types of crypto assets besides cryptocurrencies. Additionally, it would be interesting to explore the accounting challenges associated with mining cryptocurrencies and other activities in the crypto asset market.

CONCLUSION

Cryptocurrencies have gained immense popularity in recent years. These virtual currencies have the potential to revolutionise the way we conduct financial transactions and manage our finances. However, their decentralised nature and lack of regulation have presented several challenges from an accounting perspective. The aim of this thesis was to pinpoint the particular challenges that emerge when handling cryptocurrency in terms of accounting and to assess the existing methods employed to tackle these challenges.

Through qualitative research, specifically semi-structured interviews, the author was able to gather valuable insights from experts in the field. The specific challenges faced by people responsible for preparing financial information when dealing with cryptocurrency in Estonia include lack of clear regulation, lack of understanding and knowledge about cryptocurrency, and difficulties in obtaining relevant and up-to-date information about cryptocurrency transactions. In addition, the specialists highlight communication with clients as a challenge and believe it is hard to find a qualified auditor for companies dealing with cryptocurrency in a current setting.

Current accounting methods for handling cryptocurrencies include treating them as inventory, short-term investments and intangible assets or financial instruments in rare cases. The specific classification to be used depends on the purpose of possessing cryptocurrencies. The specialists tend to use fair value accounting and specific software designed for cryptocurrency accounting.

Potential risks associated with accounting for cryptocurrencies include volatility and uncertainty in valuation, security risks such as hacking or theft, regulatory risks and incorrect representation in the accounting reports and statements. Appropriate accounting practices can mitigate these risks by ensuring proper documentation and record-keeping, implementing internal controls to prevent fraud or errors, and staying up-to-date with regulatory changes.

Based on these findings, it is clear the Estonian government should consider implementing regulations specific to cryptocurrency accounting to provide clarity and guidance for accountants. There is also a need for adapted and specific education or training on cryptocurrency accounting among accountants in Estonia. The companies should invest in specialised software designed for

cryptocurrency accounting to ensure accurate reporting and decrease the workload of specialists involved in the process of cryptocurrency accounting.

It must be noticed that this study has certain limitations. Due to Estonia's lack of expertise in cryptocurrency accounting at the time of data collection, it was challenging to find the accountants and other specialists dealing with cryptocurrency reporting. The number of individuals who consented to be part of the interviews was even lower, thus the sample size is relatively small. Another limitation of this study is that it focuses solely on cryptocurrencies and does not take into account other types of crypto assets. While cryptocurrencies are a significant part of the crypto asset market, there are other types of assets that may have other challenges. Additionally, this study may not be generalisable to other countries or regions since it only examined Estonia's experience with cryptocurrency accounting.

Despite these limitations, the conclusions and proposals presented in this paper have important implications for the accounting industry in Estonia and beyond. As cryptocurrency continues to gain popularity and become more mainstream, it is crucial that accountants are equipped with the knowledge and tools necessary to properly account for these assets.

This study has shed light on the challenges and potential solutions related to cryptocurrency accounting in Estonia. By implementing appropriate accounting practices and staying up to date with regulatory changes, accountants can effectively mitigate risks associated with cryptocurrency accounting. Further research is needed to fully understand the impact of blockchain technology on the accounting industry, but this study provides a valuable starting point for future investigations.

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APPENDICIES

Appendix 1. Questions for an expert interview

1. Can you describe your experience in dealing with cryptocurrency accounting in Estonia? How long have you been working in this field?

2. What are the specific challenges you have encountered while preparing financial information involving cryptocurrency in Estonia?

3. What accounting methods and solutions do you currently use for handling cryptocurrencies? Could you explain the advantages and disadvantages of these methods?

4. How do you ensure accurate and transparent accounting for cryptocurrencies in compliance with legal and regulatory requirements in Estonia?

5. Have you encountered any ethical or professional dilemmas when accounting for cryptocurrencies?

6. What auditing practices do you use to ensure the accuracy of your cryptocurrency accounting?

7. What potential risks do you see in accounting for cryptocurrencies, and how can these risks be mitigated through appropriate accounting and auditing practices?

8. In your opinion, what measures can be taken to improve the current accounting and auditing practices for cryptocurrencies in Estonia?

Appendix 2. Interview transcripts

The complete interview transcripts have been made available to the Defence Committee and can be accessed from the link provided below on an external server:

https://drive.google.com/drive/folders/1NVWHG_YeFoofuNt9eSDQYCQ1xE4_2n6I?usp=sharing

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