



Anastasia Laine

Accounting for Cryptocurrency

Metropolia University of Applied Sciences

Degree Bachelor of Business Administration

Degree Program in International Business and Logistics

Thesis Accounting for Cryptocurrency

Date 31.10.2022

Abstract

Author(s): Anastasia Laine
Title: Accounting for Cryptocurrencies
Number of Pages: 56 pages + 1 appendices
Date: 31 October 2022

Degree: Bachelor of Business Administration
Degree Program: International Business and Logistics
Specialization option: Finance and Accounting
Instructor(s): Kevin McIntire, Supervisor

The idea of peer-to-peer electronic cash was introduced in a whitepaper by the pseudonym Satoshi Nakamoto in 2008. The primary objective was not to create a completely new currency but to establish a decentralized payment system for different parties without a financial institution. What started as Bitcoin, grew into a nearly 2 trillion USD investment industry available to retail investors, organizations, and institutional investors.

Currently, there is no unified accounting and classification framework for cryptocurrencies and other cryptographic assets. Consequently, there is no generally accepted definition for crypto assets. Hence, the primary objective of this study is to identify the appropriate financial reporting framework and determine the risks stakeholders and investors face from unharmonized accounting and classification treatment.

As a result of a comprehensive overview of the existing financial reporting standards it appears that theoretically, cryptocurrencies and other cryptographic assets fall under the definition of 'Intangible Assets' of both GAAP and IFRS standards. However, in practice financial reporting is judgmental. Therefore, a standalone standard implementation seems to be appropriate. Although it is an expensive and time-consuming process, it still appears to be the only solution to solve investor protection, classification confusion, taxation, monetary policy, financial system stability, and money laundry risks.

Keywords: Cryptocurrency, Cryptographic assets, Accounting, Financial Reporting, Intangible Asset

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1 Introduction

Cryptographic assets, including Bitcoin, are digital representations of value, that can be exchanged, transferred, and used for payment or investment purposes. Crypto assets were created as a result of a whitepaper published by the pseudonym Satoshi Nakamoto in 2008. Ever since, cryptocurrencies and other cryptographic assets have gained enormous attention from the public. What started as Bitcoin, grew into a nearly 2 trillion USD investment industry (Statista, 2022). However, regulators and authorities such as central banks, standard-setting bodies, accounting representatives, and securities commissions are facing great challenges while studying and solving regulation, standardization, and financial reporting guidance for this emerging digital asset category. Consequently, the crypto market is not highly regulated and does not have a clear financial reporting framework, leading to ambiguous financial information and generating false profit measurements in organizations that hold crypto. As a result, stakeholders make uninformed economic decisions, and more importantly, companies can have false economic benefits or losses which in turn affect their common stock prices.

Academic work investigating various aspects of cryptographic assets is being conducted as cryptocurrencies and other crypto assets become more accessible to the public. However, most studies focus on Bitcoin and its price volatility or crypto market correlation to fiat currency, gold, the stock market, and others. The feature that has not been studied enough is the financial reporting of companies holding cryptographic assets. Currently, there is no harmonized accounting or classification framework for cryptocurrencies or any other cryptographic assets. Hence, the definition of crypto assets is nonexistent. Therefore, this research focuses on examining existing financial reporting standards and determining the challenges that companies are confronting while reporting holdings of this emerging digital innovation. More importantly, the primary objective is identifying the appropriate financial reporting framework and determining the risks stakeholders and investors face from unharmonized accounting and classification treatment.

Standard-setting bodies such as Generally Accepted Accounting Principles (GAAP) by Financial Accounting Standards Board (FASB) and International Financial Reporting Standards (IFRS) by International Accounting Standards Board (IASB) suggest presenting cryptographic assets mostly as 'Intangible Assets' in the financial statements. However, this has raised numerous debates on the subject among accounting representatives. Various research papers address the arising issues since even if theoretically crypto falls into the scope of intangibles, their impairment treatment and revaluation appear to be outdated, and more importantly, unharmonized, leading to false profit and loss information.

At the beginning of this study, the fundamental characteristics of assets, their financial features, and accounting treatments will be defined. Thereafter, cryptographic assets and their unique qualities will be studied and presented in detail, especially from a financial reporting perspective. Subsequently, specific GAAP and IFRS standards, such as cash and cash equivalents, financial investments, investment property, tangible assets, and intangible assets will be analyzed concerning cryptocurrencies, and briefly to other cryptographic assets, and whether the standards are appropriate for reporting this type of digital assets. Above all, the commonly suggested standard for reporting cryptocurrencies 'Intangible Assets' will be compared between GAAP and IFRS, and then the main differences between the two accounting frameworks will be identified and examined.

Finally, the annual reports of two companies are analyzed in detail to test the theory of treating cryptocurrencies as intangible assets.

2 Methodology

Today there is no standalone financial reporting standard that addresses specifically cryptocurrencies or generally cryptographic assets. Since authoritative guidelines are nonexistent the research focuses on collecting qualitative data from existing IFRS and GAAP financial reporting frameworks.

A comprehensive overview of the existing financial reporting standards will be executed to discover suitable standards for reporting the company's financial information of holding cryptocurrency. Thereafter, standards that seem to be considered by the IFRS, GAAP, or other accounting representatives are presented in the research. Subsequently, each standard is analyzed concerning cryptographic assets, especially cryptocurrencies. Moreover, numerous articles and debates by experts of the Big Four organizations (Deloitte, EY, KPMG, and PwC) and other professionals are studied to form an objective conclusion about existing standards and whether they can present reliable financial information and what are the consequences of unharmonized accounting framework.

Additionally, to test the discovered theoretical results annual reports of two companies holding cryptocurrencies will be assessed focusing primarily on impairment and evaluation treatment.

3 Financial Reporting Standards

Accounting standards are guidelines and regulations governing bodies use to standardize how companies record and present their financial information. These guidelines and regulations dictate how a company presents its financial statements and how it accounts for numerous factors such as depreciation and amortization. The primarily used accounting frameworks are International Financial Reporting Standards (IFRS) issued by International Accounting Standards Board (IASB), and Generally Accepted Accounting Principles (GAAP) issued by Financial Accounting Standards Board (FASB) (KPMG, 2021).

The IASB is a non-profit organization that aims to establish a single set of global accounting standards. The main objective is to provide investors with a more accurate and timely view of the financial transactions of organizations that operate in different business sectors, classes, or countries. As a result, stakeholders can make informed economic decisions and respectfully compare different companies' financial information. Currently, over 165 countries use the

IFRS standard for financial reporting, including the European Union, South Korea, Australia, India, and many others (IFRS, 2022).

FASB is responsible for establishing GAAP rules and is recognized by the U.S. Securities and Exchange Commission (SEC) as the designated accounting standard setter for public companies in the United States (KPMG, 2021).

Thereby, organizations in the US must follow GAAP rules when preparing their annual financial statements. These guidelines and regulations ensure that the financial statements presented by public companies are in line with the latest accounting practices. Thus, investors and other stakeholders can make informed investment and business decisions (FASB, 2021).

IFRS is a standard-based approach used in various countries whereas GAAP is a rule-based system used by companies operating in the United States. Specifically, US GAAP delivers detailed rules and procedures that do not leave room for interpretation and aims to prevent organizations from creating special exceptions that are aimed at maximizing their profits. While IFRS is a principle-based guideline that companies should follow and interpret the information to their best judgment, therefore allowing companies flexibility and the ability to make different interpretations of the same situation (KPMG, 2021). To conclude, due to the varying legal systems and business customs in different countries, implementing regulations based on the strict rules of the US GAAP can be particularly challenging. Thereby, IFRS allows flexibility and is aimed at being used worldwide.

There are numerous differences between IFRS and GAAP frameworks concerning amortization, depreciation, impairment, measuring carrying value, treatment of inventory, classification of liabilities, and others (KPMG, 2021) that will be discussed in detail in the later sections, concerning cryptocurrencies and other cryptographic assets.

4 Assets Defined

The capital of the business is used to buy assets that can be used to generate revenue. Assets can be categorized based on their nature and type, however frequently assets are classified based on their convertibility into cash. Thereby, non-current assets are long-term investments with a lifespan of more than a year and are not easily converted into cash. Whereas current assets are short-term items that can be liquidated quickly and used for a company's immediate needs (Zyla and Black, 2018). Examples of non-current assets are tangible assets, such as property, plants, and equipment, and intangible assets, such as trademarks and patents. Then again, typical current assets are cash, cash equivalents, and inventory.

Assets and their values are reported on a company's balance sheet, which gives stakeholders information on its financial position and what it owns and owes. The information represented in the balance sheet is organized according to the following equation:

Assets = Liabilities + Owners' Equity (Zyla and Black, 2018).

A balance sheet should always be identical, in other words, assets must be equal to liabilities plus owners' equity. Liabilities represent the amount owed to other parties and owners' equity represents the company's net worth, total assets minus liabilities (Vickerstaff and Parminder, 2012).

Often assets are presented in the balance sheet in order of which longest holding comes first, as presented in Figure 1 below, where land and buildings are expected to be in the company for longer than equipment and motor vehicles.

M.Y. Name**Statement of Financial Position as at 31 December 20X2**

	£	£
Assets		
Non-current assets		
Land and buildings	110,000	
Plant and equipment	46,000	
Fixtures and fittings	3,100	
Motor vehicles	<u>15,200</u>	
		174,300
Current assets		
Inventory	9,600	
Accounts receivable	4,100	
Cash at bank	5,300	
Cash in hand	<u>200</u>	
<i>Total assets</i>		<u>193,500</u>
Capital		
		65,400
Non-current liabilities		
Loan		100,000
Current liabilities		
Bank overdraft	27,000	
Accounts payable	<u>1,100</u>	
		<u>28,100</u>
		<u>193,500</u>

Figure 1. Statement of Financial Position (Vickerstaff and Parminder, 2012, page 41)

At the end of the fiscal year, a company's asset value is calculated for its annual reports and tax filings. Depending on the type of asset, it may be depreciated or amortized (Flood, 2021). The amortization method is utilized to decrease the cost of an asset over time. While the depreciation method is the reduction in the value of an asset over time, due in particular to wear and tear. Understanding these methods' differences helps make informed purchase decisions and establish the asset's accurate and useful life. Moreover, it is crucial for determining tax liabilities and deductions over the asset's life (Zyla and Black, 2018).

4.1 Amortization, Depreciation and Impairment

When a company decides to acquire an asset, such as a vehicle or a patent, it provides the company with numerous benefits over time, not only during the year it was acquired but also long after that. The cost can be expensed over its useful life to accurately reflect asset use. The expense amounts are then used as a tax deduction, reducing the business's tax liability (Zyla and Black, 2018).

Tangible assets, often referred to as fixed assets, such as property, plants, and equipment, are often major expenses for organizations. Depreciation is a fixed asset's expected wear and tear and allows companies to spread out the costs and match depreciation expenses to related revenues. To clarify, companies take depreciation regularly so they can move their assets' costs from their balance sheets to their income statements (Vickerstaff and Parminder, 2012). Subsequently, the company's net profit and thereby, the tax liability is lower with depreciation costs.

For example, a beauty salon buys equipment for 10000 EUR, which has a five-year life span. Instead of accounting for the entire cost in the year of purchase, which reflects negatively on the company's profit, the company decides that it can sell the equipment after five years for 2000 EUR. Based on these assumptions, the depreciable amount is 8000 EUR (10000 EUR – 2000 EUR). Then again, the annual depreciation using a straight-line method is calculated by dividing the depreciable amount by the total number of useful life years for the assets. In this case, it is 1600 EUR (8000 EUR / 5 years). This results in a depreciation rate of 20% (1600 EUR / 8000 EUR). Depreciation directly impacts the company's tax liabilities. In this case profit before depreciation is 5000 EUR and tax rate is 25%, and the tax liability is 1250 EUR (5000 EUR * 25%). However, with depreciation, the taxable profit is 3400 EUR (5000 EUR – 1600 EUR), and the tax payable at 850 EUR (3400 * 25%) which is 400 EUR less than without depreciation costs. As a result, the immediate cost of ownership is significantly reduced since not accounting for depreciation can affect a company's profits. Companies depreciate long-term assets for both tax and accounting purposes.

Amortization is the expected cost of using an intangible asset, such as a patent or trademark, to produce revenue. According to FASB, similarly to tangible assets, most intangible assets have finite lives, thus their useful life must be estimated and their carrying amount must be amortized over the remaining useful life. To define amortization, the company determines a present value for the intangible asset and defines its useful life expectancy, just as with calculating depreciation. The annual amount is deducted each year from the balance sheet to reflect the asset's current book value (Zyla and Black, 2018). For instance, if a company owns the exclusive rights to a patent for 10 years, the patent is not to be renewed at the end of the term. To tie the costs associated with the patent, the company can amortize the expenses of the patent over the decade. As a result, asset expenses reflect the revenue that it generates in the same financial year. This method decreases the carrying value of the asset over time and eventually the asset is valueless.

However, according to both IFRS and GAAP if an asset has an indefinite life, in other words, the benefits from an intangible asset extend beyond the near future, the asset is not amortized (KPMG, 2021).

Impairment is unexpected damage and in accounting, it means a permanent reduction in the value of a tangible or an intangible asset (BDO, 2021). For instance, if a construction company must replace its outdoor equipment due to a natural disaster, the damage caused by the disaster can decrease the company's asset's carrying value.

The company's accountant must evaluate assets for potential impairment periodically when there is an indication of impairment. Additionally, certain assets must be reviewed annually. When the fair value of an asset is less than its carrying value on the balance sheet, both IFRS and GAAP allow impairment loss. The carrying value of an asset is calculated from the net of the booked value minus accumulated depreciation, amortization, or previous impairment losses. The difference between IFRS and GAAP lies in the mechanics of calculating impairment losses and whether historical impairment losses can be reversed. GAAP prohibits the reversal of all impairment losses. Yet, under

IFRS, impairment losses for intangibles other than goodwill and fixed assets can be reversed (KPMG, 2021).

When impairment costs are conducted responsibly, they provide investors with valuable information. For example, if assets were acquired overpriced this distorts the analysis of a company and its stock price. Moreover, if a company wrote off billions of dollars, it conveys that the management did not do promising investment decisions in the past. Then again, if the impairment is reversed under IFRS rather frequently, this suggests that the impairment loss recognized in the prior period was done incorrectly or that the asset is extremely volatile (Fujita, 2022). Overall, there are numerous variables involved in determining the value of an asset, thus impairment cost can be used to manipulate the balance sheet and income statement.

5 Cryptographic Assets

The idea of peer-to-peer electronic cash was introduced in a whitepaper by Satoshi Nakamoto in 2008 (Nakamoto, 2008). The primary objective was not to create a completely new currency but to establish a decentralized payment system for different parties without a financial institution (Procházka, 2018). Today crypto investment is available to retail investors, organizations, and institutional investors.

Cryptographic assets are transferable digital representations facilitated by technology referred to as “blockchain” (Leopold and Vollman, 2019). Crypto assets (CA’s) have the potential for advancing financial exchange, storage of value, venture capital, and contracting, but they lack clarity of form, inherent value, governance, and disclosure for investor decision-making (ISDA, 2022). CAs evolve and gain great attention from the public and their classification might change over time since their appearance in economies will grow as long as it is possible and legal to have any association with crypto.

According to CoinMarketCap (2022), there are over 20000 different crypto assets listed in the market. This number includes numerous systems and their

tokens. However, a large portion of those coins and tokens are not significant. At the end of the year 2021 global cryptocurrency market alone reached approximately 2 trillion USD (Maida, 2022) and according to Binance and CoinMarketCap largest volumes are in Bitcoin, Ethereum, and Tether. Yet, due to erratic prices of Bitcoin and other major cryptocurrencies, during the year 2022, the market capitalization fell close to 980 billion USD, on 15 June 2022 (Statista, 2022).

El Salvador was the first country to adopt cryptocurrency, Bitcoin, as legal tender. Then in April 2022, the Central African Republic declared its decision to become financially independent by accepting Bitcoin as a legal tender (BBC, 2022).

Today, cryptocurrency and other cryptographic assets are legal to trade and are regulated to a certain extent (Buchholz, 2022). Yet in numerous countries, crypto assets are banned. Then again, various countries have adopted implicit bans, where banks and financial institutions are prohibited from dealing with crypto and offering them in their services. The countries are represented in Figure 2 below.



Figure 2. Where the World Regulates Cryptocurrency (Buchholz, 2022).

5.1 Blockchain Technology

A blockchain is a system that makes it possible to create a digital ledger of data and share it among a network of independent parties (Nakamoto, 2008).

Although blockchains originated with the creation of Bitcoin and the terms are often interchangeably used, they are not the same. The former is a type of software. The latter is the name of the cryptocurrency that powers its software (Danial et al., 2022). For example, Bitcoin is a name of the cryptocurrency that has its own blockchain – which is fundamental for the secure transfer of Bitcoin.

As represented in Figure 3, a blockchain is created when the system adds a new block with each transaction. Every block has its unique nonce, hash, and references to the previous hash. Security-wise, it uses the best cryptographic algorithms, hence is argued to be nearly impossible to hack. Moreover, the process of generating each block's hash is carried out in relation to the previous block's hash values. This ensures that the data within the block is related to the previous block's data, therefore any change made to the data would require a change to the entire blockchain. This also plays a vital role in ensuring blockchain security and immutability (Lakhani and Rayle, 2018).

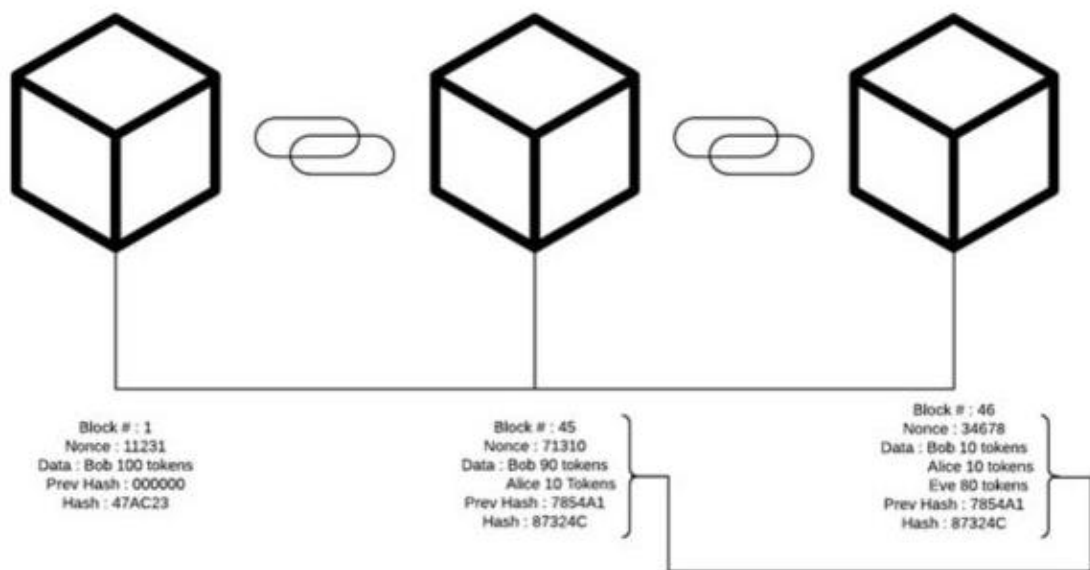


Figure 3. Cryptographically linked blocks (Shrivastava, Le & Sharma, 2020).

With blockchain technology, record-keeping can be performed with impeccable accuracy. This eliminates the time and effort that regulators, businesses, and even common people spend trying to find out who did what and when. Thus, the potential of blockchain technology is being studied and implemented even today in various sectors, such as education, agriculture, banking, and voting (Yano, Dai, Masuda, Kishimoto, 2020).

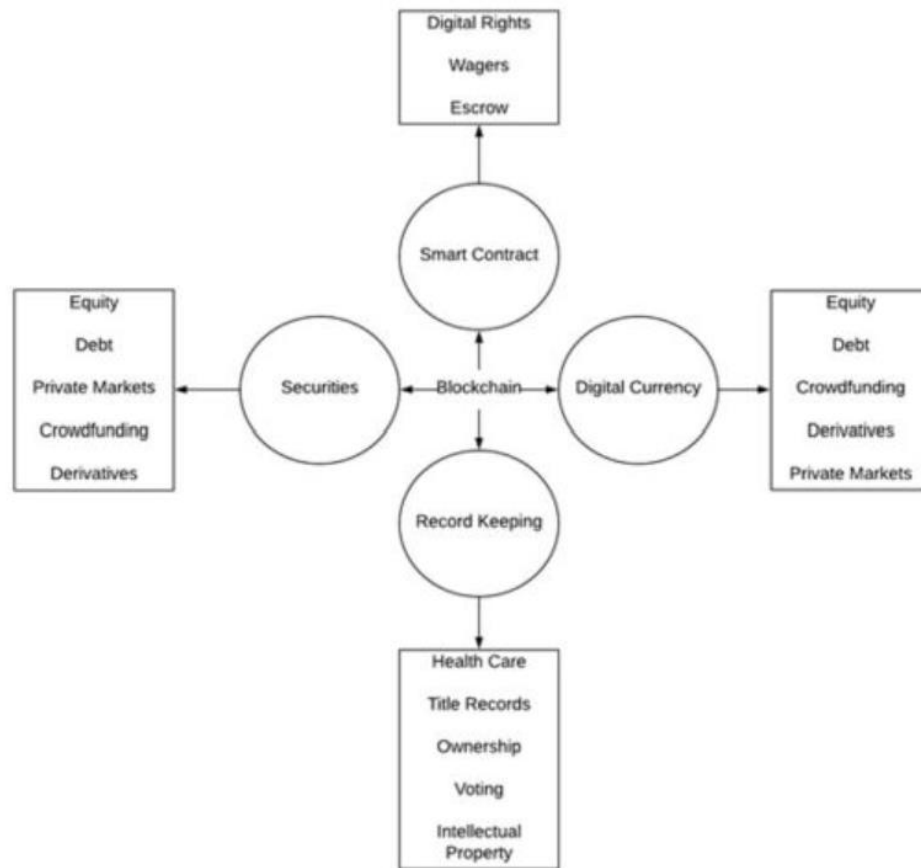


Figure 4. Different sectors of blockchain usage (Shrivastava, Le & Sharma, 2020, Figure 1.1)

As Figure 4 indicates, blockchain technology can be used in various industries. For example, record keeping for property rights, land, probate, agreements, leases, and licenses (Shrivastava, Le, and Sharma, 2020). Additionally, blockchains can be used for smart contracts. In general, a smart contract is a program that is intended to automatically execute, control, or document an action related to the contract. Smart contracts can be stored inside a blockchain server and can self-manage and self-execute payments. Moreover, they can build libraries and are good at authenticating (Gohil and Thakker, 2021).

Theoretically, blockchain can be used in the above-mentioned functions, financial services, and currency trade, however, technology is in the development stage and is being assessed in different business environments every day.

5.2 Cryptographic Assets and Their Characteristics

Cryptographic assets are an abnormal economic reality that shares certain characteristics with money, commodities, stocks, and assets, yet they do not possess all the necessary requirements to be defined in any of those categories.

Although the terms coins and tokens are often used synonymously because there is no universally accepted definition for any of them, in the crypto market, those words have vastly different meanings (PwC, 2019). A cryptographic asset can be described as either a coin or a token. The difference is that the former refers to a form of digital currency that is often native to a blockchain, with the main purpose of storing value and working as a medium of exchange. While the latter refers to an asset that gives the holder additional functionality or utility (Smith, 2019). Another main difference between the two is that coins are mined, and tokens are created and distributed by the project developer (Lakhani and Rayle, 2018).

Mining is a process that involves creating new digital coins. To recover the coins, a machine solves complex puzzles and validates the transactions that have occurred on a blockchain (Aumasson, 2021). All the major blockchains have coins that power the blockchain network. Bitcoin blockchain coin is BTC and Litecoin has LTC (CoinMarketCap, 2022). Then again, blockchains have tokens that are created through initial coin offerings (ICO) (Leopold and Vollmann, 2019). Companies issue tokens, and they can be in different forms that give rights to redeem off-chain assets (i.e., gold, property, stocks), give discounts for trading fees, or pay for goods (Binance Academy, 2022).

Cryptocurrencies, such as Bitcoin, have the sole purpose is to function as means of exchange and they share some characteristics with traditional currencies. Yet, they are not issued or governed by any authorities and are not backed by any commodities (García-Monleón, Danvila-del-Valle, and Lara, 2021). Consequently, they are not considered legal tender.

A stablecoin is a type of token that aims to link its values to fiat currencies such as the US dollar, gold, or other precious metals and even commodities. Their objective is to rid the crypto market of volatility in assets. For example, Tether is backed by a ratio of 1:1 with USD. They aim to fill that gap between the traditional financial system and crypto (Aramonte, Huang, and Schrimpf, 2021).

Security and asset-backed tokens are tied to the underlying assets of a company, such as its earnings stream and dividends or interest payments. As a result, their economic function is like equities, bonds, and derivatives (Chou, Agrawal, and Brit, 2021).

Utility tokens are like coupons or vouchers but in a digital form. They provide users with the opportunity to access a service or product through a blockchain. A person who bought a utility token can redeem it for promised product or service. The inherent value of these types of tokens is the demand for the issuer's services and products (Chou, Agrawal, and Brit, 2021).

Additionally, there is a group of certain tokens that have become extremely popular in recent years. Non-Fungible Tokens (NFTs) are tokens representing something unique and collectible using blockchain technology. These types of tokens have caught the attention of investors due to their unique properties. One of the most popular examples is the NFT of artist Beeple, whose NFT artwork called "Everyday - The First 5000 Days" was auctioned for \$69 million (Binance Academy, 2022). NFTs are associated often with digital art, yet they have also other functionalities, such as game characters, real-life assets, and music royalties (Fortnow and QuHarrison, 2021). Figure 5 is represented a collectible cat that can breed to pass its traits on to new cats.

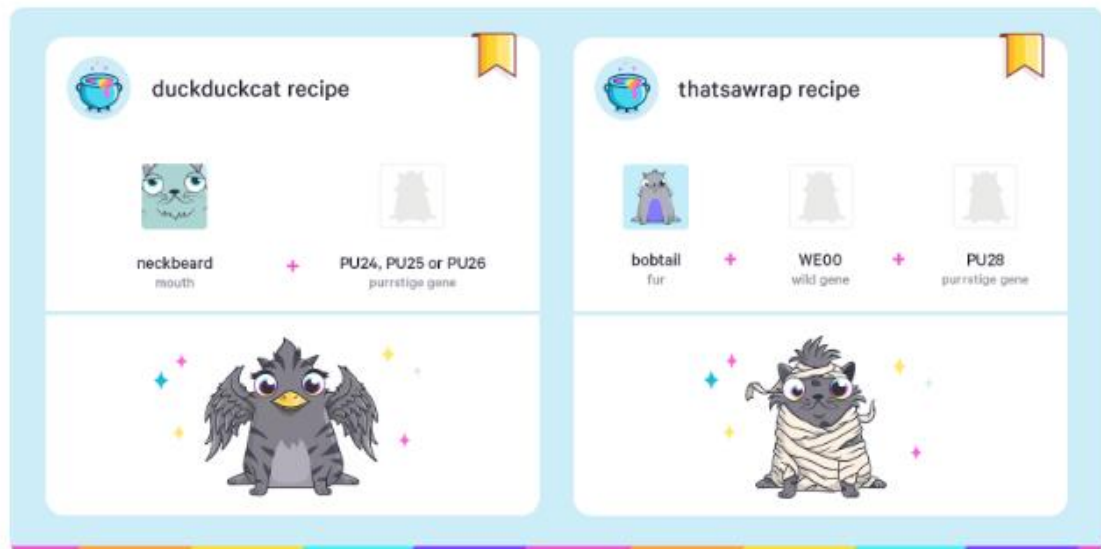


Figure 5. The character of Game CryptoKitties on Ethereum Blockchain (Binance Academy, 2022)

5.3 Intrinsic Value of Cryptocurrency

The definition of fiat currency plays a vital role when considering the intrinsic value of cryptocurrency. For any technology or commodity, be it silver, gold, bank notes, digital currency, or bitcoin, to be accepted as a monetary standard, it must perform three functions (Kiviat, 2015):

- Be a medium of exchange
- Be a store of value
- Be a unit of account

Cryptocurrencies, such as Bitcoin (BTC), have a market price and can be traded on the exchange platforms like CoinMarketCap and Binance. Yet, today it is still not considered a legal tender due to numerous factors; it is not backed by a government, it is not widely used in the economy, it cannot be generated as and when required, and it has limited units (Bitcoin 21 million units). (García-Monleón, Danvila-del-Valle, and Lara, 2021). Furthermore, in economics money

is frequently described as a unit of account. This relates to the ability to measure the value of items and services, such as property, hair cut or nearly everything. In other words, money allows us to evaluate products similarly meters allow us to measure distance (Hillman, 2014). Cryptocurrencies or any other cryptographic assets cannot act as a unit of account due to large volatility risks to their holders, since the price might be different every second, which will make measuring items and services nearly impossible.

Furthermore, according to a study by Hacıoglu, Bitcoin price is stimulated by its own prices. Thus, supply and demand functions are the main determinants of the BTC value rather than any other values that were tested in the research (fiat currencies, gold, oil). Leading to the conclusion that Bitcoins value is primarily derived from the supply and demand in the market. The concept of supply and demand is a combination of two fundamental economic principles. It states that when the supply exceeds the demand for an item, the price falls. Then again, when the demand exceeds the supply, the price rises (Hillman, 2014). Despite the lack of support for the currency nature, several professionals and authorities support the fact that BTC has a valuable function in its scarcity. As the supply diminished over the years due to limited units, demand has increased, and the price with it (Khan and Tahani, 2022).

Utility tokens are initially valued based on the value of goods or services to which they give access if those items or services have a commonly recognized price or market value (García-Monleón, Danvila-del-Valle, and Lara, 2021). Yet, tokens generate the utility and thereby, the value only when they are exchanged. Until then the token does not have any intrinsic value. Moreover, the value of an item or service is dependent on the supply and demand of the item or service.

Security tokens represent a stake, a share in stock or equity, and the right to dividend or interest payments. Owners or holders of tokens receive part of the profit from the issuers or managerial actions and decisions. They are issued through Security Token Offering (STO), and they can be divided into two subgroups: equity and asset-backed token. The former is like traditional stocks

where investors are entitled to dividends and the latter asset group is backed by real-life assets, such as gold, oil, art, and so on (Baker, Nikbakht, and Smith, 2021). Their value derives from the asset that they give access to, whether it is a stock or any precious metal, and the supply and demand for those items.

To conclude the above-mentioned facts, the intrinsic value of cryptocurrency and other cryptographic assets are fundamentally explained by the law of supply and demand as crypto assets are rather speculative and essentially independent from external economic realities. Furthermore, utility and security tokens are frequently valued by real-life assets and their supply and demand, yet those are valued in fiat currency. This brings challenges in the valuation process and leads to high volatility and insecurity in the trade.

6 Accounting applications

For accounting purposes, it is important to classify cryptographic assets into distinct categories based on their characteristics. However, there is no single framework that can be used to classify crypto assets into individual groups, since various features and qualities of them are not widely accepted.

This study observes the following characteristic:

- The primary purpose of the cryptographic asset; and
- How the cryptographic asset derives its inherent value.

In the following table most common subsets of crypto assets are defined:

Cryptocurrency	Stores value and act as a medium of exchange. Unlike traditional currency, cryptocurrencies are not governed by
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	central authorities and their value is based solely on supply and demand.
Asset-backed token	The digital token represents ownership of a physical asset, such as gold or oil. It derives its value based on the underlying asset.
Security token	Token provides an economic stake in a legal entity e.g., rights to dividends and the ability to vote. Value is derived from the success of the entity and its future profits.
Utility token	Provides users with access to a product or service. Value is derived from the demand for the issuer's service or product.

Table 1. Subsets of crypto assets and their characteristics (AICPA, 2022)

IFRS and GAAP do not include specific guidance on the accounting for cryptographic assets and there is no clear industry practice. Thus, the accounting for these assets could fall under multiple standards that were established long before digital assets existed.

This study focuses primarily on cryptocurrencies held by an entity. Along with the research, other cryptographic assets are briefly discussed in the following sections.

6.1 Cash and Cash Equivalents

IFRS and GAAP do not define cash, money, or cash equivalents explicitly, thus a general definition of money shall be used. As discussed in chapter 5.3

Intrinsic Value Considerations of Cryptocurrencies, for any item to be accepted as legal tender it must perform three functions:

- Be a medium of exchange
- Be a store of value
- Be a unit of account

As a form of digital money, it might be expected that a cryptocurrency holding could be accounted for as cash. Although cryptocurrencies have similarities to fiat currency they do not fall in the scope of cash and cash equivalents.

Cryptocurrencies lack evidence of being used largely by societies as a medium of exchange, and they are not backed by a government or central bank (Grant Thornton, 2018). Moreover, cryptocurrencies are currently not capable of setting prices for goods and services directly. In other words, cryptocurrencies might be accepted to settle certain transactions, but they are not directly related to the setting of prices for goods or services in an economy (Chou, Agrawal, and Birt, 2022).

Similarly, the American Institute of Certified Public Accountants (AICPA), describe that crypto-assets do not meet the definition of cash or cash equivalents, as defined in the FASB ASC Master Glossary when they are not considered legal tender and they are not backed by sovereign governments (AICPA, 2022).

Thereby, it appears that as long as cryptocurrencies are not widely accepted in economic societies, they have not considered cash or cash equivalents. Moreover, the major issue seems to be volatility as it prevents cryptocurrencies from being able to set prices for goods.

6.2 Financial Instruments

Another approach to accounting for cryptocurrency holdings would be to account for them as financial assets.

According to IAS 32, IFRS, a financial instrument is a contract that gives rights to a financial asset of one entity and a financial liability or equity instrument of another entity (Deloitte, 2022).

A financial asset is any asset that is:

- “Cash
- An equity instrument of another entity
- A contractual right
 - To receive cash or another financial asset from another entity; or
 - To exchange financial assets or financial liabilities with another entity under conditions that are potentially favorable to the entity” (IFRS, 2022).

Holding a unit of a cryptocurrency does not give the holder the right to receive cash or other financial assets, it does not create a contractual relationship between the holder and the entity. Additionally, cryptocurrencies do not provide a residual interest in the assets held by the company after it has deducted all its liabilities (IFRS, 2019) (AICPA 2022). As a result, cryptocurrencies do not meet the definition of financial assets.

In certain cases, security token holders have the right to receive a financial asset or cash from their platform's future performance. This could be based on the value of an underlying asset or the platform's residual interest. However, it is important to note that these rights and obligations are only legally enforceable if a contractual relationship exists (Leopold and Vollman, 2019). If a security token does not provide its holder with a right to cash or other financial assets, then it will not be considered a financial asset. To classify and measure security tokens that meet the financial asset standard, entities should follow IFRS 9's guidance on financial instruments (Chou, Agrawal, Birt, 2022). However, under some circumstances where the asset-backed token gives the right to gold but

does not give a contractual right to receive cash or another financial asset, it might be inappropriate to apply IFRS 9 Financial Instruments.

6.3 Investment Property and Tangible Assets

Certain authors have suggested that the distinct types of cryptocurrencies could be considered investment property.

According to IAS 40, IFRS:

Investment property is land or a building (including part of a building) or both that is:

- Held to earn rentals or for capital appreciation or both.
- Not owner-occupied.
- Not used in production or supply of goods and services, or for administration; and
- Not held for sale in the ordinary course of business (IFRS, 2022).

Although certain entities hold cryptocurrencies for capital appreciation, it is not appropriate for them to be considered investment property, as they are not physical assets, they should not be accounted as such

IAS 16, IFRS, defines property, plant, and equipment as tangible assets that are:

- Held by an entity for use in the production or supply of goods or services, for rental to others, or administrative purposes; and
- Expected to be used for more than one financial period (IFRS, 2022).

ASC 360 of U.S GAAP defines property, plant, and equipment similar to the IAS 16 of IFRS (FASB, 2001).

Additionally, according to both, IFRS and GAAP accounting frameworks, plant, property, and equipment may be recorded as tangible assets only if:

- Future economic benefits are associated with the asset and will flow to the entity, and
- The cost of the asset can be measured reliably (Deloitte, 2022).

Considering the above-mentioned standards, cryptocurrencies do not fall into the scope of IAS 16 or ASC 360, 'Property, Plant, and Equipment, since they are not tangible items.

6.4 Inventory

Depending on the company's business practice, cryptocurrencies could be accounted as inventory under IFRS (Grant Thornton, 2018). Yet, under GAAP crypto assets that are held for sale in the ordinary course of business, are not tangible assets and therefore may not meet the definition of inventory, as defined in the FASB ASC Master Glossary (AICPA, 2022).

"According to IAS 2, IFRS, inventories include:

- Assets held for sale in the ordinary course of business (finished goods)
- Assets in the production process for sale in the ordinary course of business (work in process)
- Materials and supplies that are consumed in production (raw materials)" (IFRS, 2022)

IAS 2 does not require inventories to be physical items. Therefore, an entity that actively trades cryptocurrencies, buying them for resale shortly, might consider

IAS 2 as an accounting method (Leopold and Vollman, 2019). Normally, this would mean that the entity has recognized the value of its assets at the lower of their cost and net realizable value. However, if it is a broker-dealer that trades cryptocurrencies, then the value of its assets should be valued at fair value fewer costs to sell, with changes in fair value recognized in profit or loss. This type of inventory is usually acquired to generate a profit from the fluctuations in the price of cryptocurrencies (Grant Thornton, 2018). The standard shall be applied only in certain cases where the business model involves selling cryptocurrencies.

On September 21 of June 2021, IFRS finished its project on analyzing “Holdings of Cryptocurrencies” and confirmed the above-mentioned treatment (IFRS, 2019).

To conclude, although IFRS prohibits treating cryptocurrencies as investment properties or as tangible assets due to the lack of their physical appearance it is allowed to account for cryptocurrencies as inventories, even though they are not physical items. Unlike IFRS, GAAP does not give room for interpretations, being strictly a rules-based accounting framework. Thereby, GAAP prohibits using standard ‘Inventories’ even in situations where business practices selling and buying cryptocurrencies actively.

6.5 Intangible Assets

State authorities and regulators strongly advise that cryptocurrency shall not be treated as cash, financial instrument, or investment property. Thus, if a cryptocurrency does not meet any of the above-mentioned definitions, it will likely meet the definition of an intangible asset under IAS 38, ‘Intangible Assets’, IFRS, or ASC 350 ‘Intangible Assets’, GAAP.

Intangible assets are items that do not have a physical presence and include legal and/or contractual rights that are expected to provide future economic benefits for the organization. For example, patents, copyrights, logos, and trademarks. Goodwill is also an intangible asset but can only be recognized as

an intangible asset upon acquisition of a business, not generated internally (Shamrock, 2012). IFRS and GAAP advise recognizing CCs as intangible assets, with the cost model as a preliminary method of measurement and the revaluation model as an alternative under IFRS, except if it is possible to recognize them as Inventory under IFRS.

According to IAS 38 and ASC 350 to meet the definition of an intangible asset, an item lacks physical substance and is:

- “Identifiable.
- Controlled by the entity.
- Expected to provide future economic benefits to the entity” (IFRS, 2022).

Moreover, both accounting standards clarify that an intangible asset is recorded on a company’s balance sheet, only if:

- “It 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, asset, or liability; or
- It arises from contractual or other legal rights, regardless of whether those rights are transferable or separable from the entity or other rights and obligations” (Deloitte, 2022).

Cryptocurrencies meet the intangible asset definition by the following features:

- They are not cash
- They lack physical form
- They are identifiable because they can be sold, exchanged, or transferred in peer-to-peer transactions

- They are a digital resource that is controlled by their holder
- They are expected to deliver future economic benefits to the entity

Once an organization has determined that cryptocurrencies should be accounted under IAS 38 or ASC 350, as intangibles, the measurement method must be determined. Additionally, an entity must establish whether this type of asset must be amortized over time. Initially, intangible assets are measured at cost and are subject to impairment testing and amortization. However, if an intangible asset is classified as infinite, in other words, there is no limit to the period in which the asset generates cash for the entity, then the asset is not amortized (Deloitte, 2022). The useful life of an intangible asset should be considered indefinite if no legal, regulatory, contractual, competitive, economic, or other factors limit its useful life to the reporting entity. Given the nature of many crypto assets, they will usually have an indefinite useful life (PwC, 2021).

Under IAS 38, crypto and other assets that are identified as intangibles are subject to impairment testing at least annually unless there is a triggering event that indicated that the value of the asset changed during the year (PwC, 2021).

Intangibles are measured following either cost or revaluation models. Under the cost model (historical cost), intangible assets should be carried at cost less accumulated amortization and impairment losses. Alternatively, the revaluation model allows intangible assets to be carried out at a revaluated amount (fair value), minus any subsequent amortization and impairment. Yet, this model is applied only if fair value can be determined reliably by reference to an active market (Grant Thornton, 2018).

Additionally, according to IAS 38, a revaluation increase is recognized in the form of a profit or loss. However, this increase should not be recognized in the same manner as the previous years' recognition. Instead, it should be accounted that it reverses possible revaluation decrease from the previous year first. Then again, a revaluation decrease is generally recognized in the form of a

loss or profit, to the extent that it reverses possible revaluation surplus from the previous year (Grant Thornton, 2018).

Table 2 below summarizes the revaluation accounting steps under IAS 38, IFRS.

	First step	Second step
Increase in value	Account for profit or loss to the extent of reversing any decreases in profit or loss from the previous year is covered.	The remaining balance, if there is any, is accounted for profit or loss.
Decrease in value	Account for loss or profit to the extent that increases in profit or loss from the previous year are covered.	If there is any, the remaining balance is accounted for loss or profit.

Table 2. Order of accounting with revaluation model (Grant Thornton, 2018).

According to ASC 350, GAAP, if a reporting entity purchases a crypto asset using cash, the value of the cash paid, including transaction costs, represents the cost of the crypto asset for the buyer. After establishing whether the assets have a finite or indefinite life, the entity prepares an impairment and amortization plan. If the asset is classified as indefinite intangible, it is not amortized. Like IAS 38, under ASC 350, intangibles are assessed for impairment annually or upon a triggering event. An indefinite intangible asset is impaired when its carrying amount is greater than its fair value (PwC, 2021). GAAP does not allow a revaluation model in case of an increase in the assets' fair value (AICPA, 2022).

For example, an entity acquired one unit of cryptocurrency for 10000 USD. At the end of the fiscal year, it was discovered that the crypto asset has declined to 5000 USD/unit. The organization wrote down its crypto to a new carrying value at the end of the financial year. Next year, the fair value of the asset is 8000 USD. Yet, the entity is not allowed to reverse impairment and reverse last year's loss as represented in Table 3 below.

Year	Activity	Value on the financial statement
1 st year	Cryptocurrency is bought from the market.	10000 USD
2 nd year	Cryptocurrency impairment testing and recognition of decrease in the value.	5000 USD
2 nd year	The loss is recorded in the income statement.	-5000 USD
3 rd year	The fair value of one unit is now 8000 USD, yet the last year's fair value is still valid.	5000 USD

Table 3. Representation of accounting treatment under GAAP

Table 4 below represents the same example under IAS 38, IFRS.

Year	Activity	Value on the financial statement
1 st year	Cryptocurrency is bought from the market.	10000 EUR
2 nd year	Cryptocurrency impairment testing and recognition of decrease in the value.	5000 EUR
2 nd year	The loss is recorded in the income statement.	-5000 EUR
3 rd year	The fair value of one unit is now 8000 USD ➤ Reversal revaluation was recognized in last year's loss.	+3000 EUR to the loss ➤ -2000 EUR in loss this year

Table 4. Representation of accounting treatment under IFRS

The historical price in the balance sheet represents how much cash was spent to acquire the cryptocurrency. Then again, it appears that the fair value of that asset represents more accurate information (market information) to the stakeholders. Yet, recognizing increases and decreases in the profit or loss may prevent representing fair profits of entities holding cryptocurrencies. Moreover, there are numerous challenges in representing and determining a certain value for cryptocurrencies and other crypto assets, as they are traded every day, every hour, and every second.

Although it seems that technically cryptocurrencies meet the definition of 'Intangible Assets', cryptocurrency and other cryptographic assets cannot be utilized in the same way as 'traditional' intangible assets like software, patent, or

licenses. Consequently, these digital assets do not appropriately meet the Intangible Asset definition that was established in the past. Thus, existing classification confusion in the markets leads to the fact that international investors trade only in specific markets where cryptocurrencies are classified in line with their interests. Therefore, not all stakeholders are protected similarly throughout the global market. Hence, it appears that regulatory bodies should address this matter urgently and preferably form a new unique classification and accounting framework for cryptocurrencies and other cryptographic assets to harmonize the market. Subsequently, financial institutions and institutional investors would be able to hold CCs and other CAs in their portfolios as new investment criteria and taxation would be treated similarly in different markets.

6.6 Measurement Considerations

Determining the fair value of cryptocurrency is challenging since they are driven by supply and demand. Moreover, the underlying intrinsic value is unclear, and their future benefits are nearly impossible to predict.

The balance sheet is a vital part of any company's operations, as it shows its various assets' financial position and capital sources. It helps an analyst evaluate a company's ability to meet its financial obligations and make distributions to its shareholders.

When a company records the book value of cryptocurrency in the balance sheet, this indicates that a certain amount of the company's cash was spent to acquire those assets. Overall, this would represent fiat currency spent on the asset, and give cryptocurrency value in fiat cash. Yet, the market value of the same asset might decrease or increase drastically over time, since cryptocurrency is extremely volatile. Thus, if a company records only historical values in the balance sheet and later the same asset is higher or lower in value this might lead to uninformed investor decisions leading to doubtful investing analysis and stock prices.

For instance, if a company acquires cryptocurrency for 100000 EUR and records only the historical value of this acquisition, the balance of the asset is 100000 EUR. Then again, if next year the value of the assets in the market decreases to 20000 EUR, if this is not presented in the balance sheet then the company's assets value is higher than it is supposed to be. Consequently, the investor might make an uninformed decision since he or she will assume that the company has enough equity to meet its obligations. However, if the company performs impairment and writes down the value of the assets to 20000 EUR, it will record -80000 EUR in loss and reduce the tax liabilities for that year. Moreover, if at the next impairment testing it appears that the asset is back to the value of 100000 EUR, under GAAP it is impossible to reverse the impairment. Consequently, an investor will see assets at 20000 EUR and assumes that the company does not have enough equity to meet its financial obligations. Yet again, cryptocurrencies and other cryptographic assets are extremely volatile, thus it is difficult to pinpoint any value at a given time since it might change the next second.

Under IFRS the case is somewhat more flexible since an entity is allowed to perform reversal impairment. Then again, IFRS being the standard base approach leaves room for interpretation, and, since there is no harmonized framework for cryptocurrencies, entities apply measurements, revaluation, and impairment methods to their best judgment. Consequently, stakeholders are left to interpret the financial information on their own, also to their best judgment.

Overall, it seems that fair value represents more accurately the market value of cryptocurrency. However, it might affect the actual profit or loss of the entity. Moreover, the company's taxation appears to be affected when recording value changes. Furthermore, an entity shall present a great deal of disclosure information to reflect changes in value, actual cryptocurrency unit holdings, impairment calculation methods, and prices used in the impairment testing. Additionally, besides the existing disclosure requirements for financial instruments, an entity shall present transparency in disclosing risks, particularly price volatility, unpredictable returns, and uncertainty in valuation is considered

necessary to provide meaningful and useful information to stakeholders about cryptocurrency holdings.

7 Case Studies

To test the theoretical results and form an objective conclusion of accounting principles, risks, and suitable standards, two companies that hold cryptocurrencies are analyzed in the following sections.

7.1 MicroStrategy Inc

MicroStrategy Inc (MS) is known for its public announcements of adopting the bitcoin strategy into its main business model. According to their annual report, they expanded their approach of converting excess operating cash into bitcoin during the year 2021 (MicroStrategy, 2021). MicroStrategy is a US-based organization, thus their financial reports follow GAAP rules.

**MICROSTRATEGY INCORPORATED
CONSOLIDATED BALANCE SHEETS
(in thousands, except per share data)**

	December 31, 2021	December 31, 2020
Assets		
Current assets:		
Cash and cash equivalents	\$ 63,356	\$ 59,675
Restricted cash	1,078	1,084
Accounts receivable, net	189,280	197,461
Prepaid expenses and other current assets	14,251	14,400
Total current assets	267,965	272,620
Digital assets	2,850,210	1,054,302
Property and equipment, net	36,587	42,975
Right-of-use assets	66,760	73,597
Deposits and other assets	15,820	15,615
Deferred tax assets, net	319,782	6,503
Total assets	\$ 3,557,124	\$ 1,465,612

Figure 6. Assets of MicroStrategy in 2021 and 2020 (MicroStrategy, 2021)

Figure 6 represents the assets of MicroStrategy in the years 2021 and 2020. Holdings of digital assets on 31.12.2021 were in total 2.850 billion USD (approximately 124.391 bitcoin units) reflecting roughly 900 million USD cumulative impairment losses due to price fluctuation. In 2020 the holdings

were 1.054 billion USD (approximately 70.469 bitcoin units) reflecting 70.7 million USD in cumulative impairment losses due to price fluctuation.

Figure 7, page 35 reveals impairment losses of digital assets during the years 2021 and 2020. Digital asset impairment losses of 830.6 million USD were incurred during the year 2021 and represented 69.0% of total operating expenses. Compared to the year 2020 when 70.7 million USD in impairment losses represented 17.5% of total operating expenses. Consequently, the year 2021 ended with a total net loss of 535.5 million USD, whereas the total net loss for the year 2020 was 7.5 million USD as represented in Figure 8, page 35.

MICROSTRATEGY INCORPORATED
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	Years Ended December 31,		
	2021	2020	2019
Operating activities:			
Net (loss) income	\$ (535,480)	\$ (7,524)	\$ 34,355
Adjustments to reconcile net (loss) income to net cash provided by operating activities:			
Depreciation and amortization	11,358	13,332	8,594
Reduction in carrying amount of right-of-use assets	8,189	8,210	8,105
Credit losses and sales allowances	1,509	2,732	124
Net realized (gain) loss on short-term investments	0	(94)	41
Deferred taxes	(284,221)	(20,830)	(2,614)
Release of liabilities for unrecognized tax benefits	(561)	0	(2,837)
Share-based compensation expense	44,126	11,153	10,209
Digital asset impairment losses	830,621	70,698	0
Gain on partial lease termination	0	(2,820)	0
Amortization of issuance costs and debt discount on long-term debt	7,201	1,543	0
Changes in operating assets and liabilities:			
Accounts receivable	2,618	(774)	(3,672)
Prepaid expenses and other current assets	(25)	2,346	6,415
Deposits and other assets	(1,713)	416	761
Accounts payable and accrued expenses	3,749	9,174	(7,321)
Accrued compensation and employee benefits	2,374	(6,827)	(2,658)
Accrued interest	1,222	271	0
Deferred revenue and advance payments	14,710	(20,223)	20,836
Operating lease liabilities	(10,222)	(11,171)	(8,620)
Other long-term liabilities	(1,622)	4,007	(851)
Net cash provided by operating activities	93,833	53,619	60,867

Figure 7. Cash Flow Statement of MicroStrategy, 2021 and 2020 (MicroStrategy, 2021)

MICROSTRATEGY INCORPORATED
CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except per share data)

	Years Ended December 31,		
	2021	2020	2019
Revenues:			
Product licenses	\$ 101,804	\$ 86,743	\$ 87,471
Subscription services	43,069	33,082	29,394
Total product licenses and subscription services	144,873	119,825	116,865
Product support	281,209	284,434	292,035
Other services	84,680	76,476	77,427
Total revenues	510,762	480,735	486,327
Cost of revenues:			
Product licenses	1,721	2,293	2,131
Subscription services	16,901	14,833	15,161
Total product licenses and subscription services	18,622	17,126	17,292
Product support	19,254	23,977	28,317
Other services	54,033	49,952	54,365
Total cost of revenues	91,909	91,055	99,974
Gross profit	418,853	389,680	386,353
Operating expenses:			
Sales and marketing	160,141	148,910	191,235
Research and development	117,117	103,561	109,423
General and administrative	95,501	80,136	86,697
Digital asset impairment losses	830,621	70,698	0
Total operating expenses	1,203,380	403,305	387,355
Loss from operations	(784,527)	(13,625)	(1,002)
Interest (expense) income, net	(29,149)	710	10,909
Other income (expense), net	2,287	(7,038)	28,356
(Loss) income before income taxes	(811,389)	(19,953)	38,263
(Benefit from) provision for income taxes	(275,909)	(12,429)	3,908
Net (loss) income	(535,480)	(7,524)	34,355
Basic (loss) earnings per share (1)	\$ (53.44)	\$ (0.78)	\$ 3.35
Weighted average shares outstanding used in computing basic (loss) earnings per share	10,020	9,684	10,256
Diluted (loss) earnings per share (1)	\$ (53.44)	\$ (0.78)	\$ 3.33
Weighted average shares outstanding used in computing diluted (loss) earnings per share	10,020	9,684	10,328

Image 8. Income Statement of MicroStrategy, 2021&2020 (MicroStrategy, 2021)

According to Yahoo Finance, the bitcoin price on 31.12.2021 was between 48472,53 USD (highest) and 45819,95 USD (lowest). The website also presents the close price adjusted for splits, which was 46306,45 USD. Then again on 31.12.2020, the close price for bitcoin was 29001,72 USD.

MicroStrategy acquired approximately 53.922 bitcoin units during the year 2021 for about 48710 USD per unit, and 70.469 during the year 2020 for about 15964 USD per unit. This totals approximately 124.391 bitcoin units with an average price of 32337 USD as presented in Table 5.

Total	The year 2021	The year 2020
-------	------------------	------------------

Bitcoin units	124,391	124,391	70,469
Average purchasing price	32.337,00	48.710,00	15.964,00
Historical value	4,022,431.77	2,626,540.62	1,124,967.12
Impairment		830,621.00	70,665.12
Reported value		2,850,210.00	1,054,302.00

Table 5. Linear fair value calculation of bitcoins held by MicroStrategy Inc

Yet, in case the calculation is performed in a linear manner with 'close' prices from Yahoo as represented in Table 6, the fair value of the same units is higher than the company reported.

The lowest market price at the end of the year (Yahoo)	45,819.95	45,819.95	28,201.99
Fair value	5,699,589.40	5,760,105.62	2,043,722.21

Table 6. Fair value calculation with the close price

Under ASC 350 'Intangible assets', GAAP, revaluations of intangible assets to fair value are prohibited. Thus, MicroStrategy could not report higher values in their balance sheet than the amount that they spent while acquiring bitcoins. Yet, in disclosures, they presented more details on bitcoin holdings and their fair values as represented in Figures 9 and 10.

The following table presents a rollforward of our bitcoin holdings, including additional information related to our bitcoin purchases and digital asset impairment losses within the respective periods. We have not sold any of our bitcoin as of the date of this Annual Report.

	Source of Capital Used to Purchase Bitcoin	Digital Asset Original Cost Basis (in thousands)	Digital Asset Impairment Losses (in thousands)	Digital Asset Carrying Value (in thousands)	Approximate Number of Bitcoins Held	Approximate Average Purchase Price Per Bitcoin
Balance at December 31, 2019		\$ 0	\$ 0	\$ 0	0	n/a
Digital asset purchases	(a)	1,125,000		1,125,000	70,469	15,964
Digital asset impairment losses			(70,698)	(70,698)		
Balance at December 31, 2020		\$ 1,125,000	\$ (70,698)	\$ 1,054,302	70,469	\$ 15,964
Digital asset purchases	(b)	2,626,529		2,626,529	53,922	48,710
Digital asset impairment losses			(830,621)	(830,621)		
Balance at December 31, 2021		\$ 3,751,529	\$ (901,319)	\$ 2,850,210	124,391	\$ 30,159

(a) During 2020, we purchased bitcoin using \$634.7 million in net proceeds from our issuance of the 2025 Convertible Notes and excess cash, including cash from the liquidation of short-term investments.

(b) During 2021, we purchased bitcoin using \$1.026 billion in net proceeds from our issuance of the 2027 Convertible Notes, \$990.5 million in net proceeds from our sale of 1,413,767 shares of class A common stock offered under the Open Market Sale Agreement, \$487.2 million in net proceeds from our issuance of the 2028 Secured Notes, and excess cash.

Figure 9. Detailed information on bitcoin holdings (MicroStrategy, 2021)

The following table shows the approximate number of bitcoins held at the end of each respective period, as well as market value calculations of our bitcoin holdings based on the lowest, highest, and ending market prices of one bitcoin on the Coinbase exchange (our principal market) for each respective year, as further defined below:

	Approximate Number of Bitcoins Held at End of Year	Lowest Market Price Per Bitcoin During Year (a)	Market Value of Bitcoin Held at End of Year Using Lowest Market Price (in thousands) (b)	Highest Market Price Per Bitcoin During Year (c)	Market Value of Bitcoin Held at End of Year Using Highest Market Price (in thousands) (d)	Market Price Per Bitcoin at End of Year (e)	Market Value of Bitcoin Held at End of Year Using Ending Market Price (in thousands) (f)
December 31, 2019	0	n/a	n/a	n/a	n/a	n/a	n/a
December 31, 2020	70,469	\$ 8,905.84	\$ 627,586	\$ 29,321.90	\$ 2,066,285	\$ 29,181.00	\$ 2,056,356
December 31, 2021	124,391	\$ 27,678.00	\$ 3,442,894	\$ 69,000.00	\$ 8,582,979	\$ 45,879.97	\$ 5,707,055

Figure 10. Fair value calculations of bitcoin holdings (MicroStrategy, 2021)

Although the fair value is significantly higher than the historical value of the digital assets, the company performed impairment write-downs due to price fluctuations. Any decrease in the fair value of bitcoin below carrying value at any time since their acquisition requires the company to incur an impairment charge, and such a charge can be crucial for the financial stability and appearance of the company. As a result, on December 31, 2021, MS had \$319.8 million of deferred tax assets, which reflects a 1 million USD valuation allowance. The largest deferred tax asset was related to the impairment of bitcoin holdings (MicroStrategy, 2021).

Consequently, this created significant volatility in reported earnings and decrease the carrying value of their digital assets, which in turn could hurt the

market price of their common stock. On 31.12.2020 MS's close stock price was 388,55 USD and on 31.12.2021 544,49 USD. However, from February 2022 the stock price fell and today remains at around 200 USD (Yahoo, 2022) supposedly due to years 2021 weak performance, and certain other factors as well. Overall, companies reporting under GAAP must follow strict accounting and measurement rules when reporting crypto holdings. Additionally, organizations experience high volatility risks that reflect on their total earnings and affect stock prices. Moreover, impairment losses directly affect a company's earning information and tax obligations.

7.2 Meitu

To compare GAAP and IFRS accounting treatment another company was analyzed that is comparable to MicroStrategy. Meitu Group is an AI-driven technology company providing beauty management services and assisting with the digital transformation of the beauty industry by providing SaaS services. Purchased cryptocurrencies include Ethereum ("Ethers") and Bitcoins, which are accounted for as intangible assets under IFRS. Cryptocurrencies held by the company are considered to have an indefinite life and accordingly, they are not subject to amortization and are tested annually for impairment (Meitu, 2021).

In Figure 11, page 39, the balance sheet shows that at the end of the year 2021 Meitu reported 777,402,000 RMB in intangible assets. In the year 2020 the company did not acquire any cryptocurrencies, thus reported value of 392,954,000 RMB does not include cryptographic assets. In Figure 12, page 39, the company reveals detailed information on its cryptocurrency holdings. Purchasing price was 649,969,000 RMB, currency translation differences were recorded at 11,757,000 RMB, and impairment loss was about 28,533,000 RMB (Meitu, 2021).

Consolidated Balance Sheet

	Note	As of December 31,	
		2021	2020
		RMB'000	RMB'000
ASSETS			
Non-current assets			
Property and equipment	13	383,183	360,826
Right-of-use assets	14	41,390	29,844
Term deposits	20	30,000	150,000
Intangible assets	15	777,402	392,954
Long-term investments			
– Investments in associates and a joint venture	16(a)	118,133	83,737
– Financial assets at fair value through profit or loss	16(b)	801,005	559,494
– Financial assets at fair value through other comprehensive income	16(c)	37,156	9,050
Prepayments and other receivables	19	19,504	7,890
Deferred tax assets	26	7,018	3,779
		2,214,791	1,597,574

Figure 11. Meitu Balance Sheet 2021 (Meitu, 2021)

15 INTANGIBLE ASSETS						
	Cryptocurrencies	Goodwill	Copyrights	Brand names	Customer relationship and others	Total
	RMB'000	RMB'000	RMB'000	RMB'000	RMB'000	RMB'000
As of January 1, 2021						
Cost	-	211,779	60,634	146,620	70,190	489,223
Accumulated amortization and impairment	-	(33,336)	(7,028)	(16,082)	(39,823)	(96,269)
Net book amount	-	178,443	53,606	130,538	30,367	392,954
Year ended December 31, 2021						
Opening net book amount	-	178,443	53,606	130,538	30,367	392,954
Additions (Note (a))	649,969	-	189	-	2,879	653,037
Amortization	-	-	(6,060)	(9,380)	(7,836)	(23,276)
Currency translation differences	(11,757)	-	(2)	-	(318)	(12,077)
Disposal	-	-	-	-	(5,613)	(5,613)
Impairment loss (Note (b))	(28,533)	(162,039)	-	(37,051)	-	(227,623)
Closing net book amount	609,679	16,404	47,733	84,107	19,479	777,402
As of December 31, 2021						
Cost	637,570	211,779	60,816	146,620	64,456	1,121,241
Accumulated amortization and impairment	(27,891)	(195,375)	(13,083)	(62,513)	(44,977)	(343,839)
Net book amount	609,679	16,404	47,733	84,107	19,479	777,402

Figure 12. Note 15, Intangible assets, of Meitu (Meitu, 2021)

Meitu performs impairment testing by comparing the recoverable amounts of cryptocurrencies to their carrying amounts. Thereby, impairment losses are recognized when the recoverable amount in the market is less than the carrying amount in the company's bookkeeping. However, a gain in value will only be recognized when the cryptocurrency is sold, and the market price was higher than the carrying amount (Meitu, 2021).

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For the year ended December 31, 2021

15 INTANGIBLE ASSETS (CONTINUED)

(b) Impairment loss (Continued)

(i) Impairment tests for cryptocurrencies (Continued)

The carrying amounts of cryptocurrencies of the Group are presented below:

	As of December 31, 2021 RMB'000
Ethers	322,076
Bitcoins	315,494
	637,570

Figure 13. Note 15, b, Intangible Assets of Meitu (Meitu, 2021)

Based on the impairment tests the recoverable amount of Bitcoins was lower than its carrying amount by about 28,533,000 RMB, thus this amount was recognized as an impairment loss. The recoverable amount of Ethers was higher than its carrying value by 66,757,000 RMB however, none of the Ether units were disposed of during the year (Meitu, 2021) and therefore, the impairment profit was not recorded. While Meitu recorded only a loss of Bitcoin holdings and other intangible assets. Yet, Meitu does not include information on how many units they were holding at the end of the year 2021, thus it is challenging to calculate the actual fair value of the holdings.

The difference between the two cases of treatment, it appears that both frameworks have their advantages and disadvantages. In certain situations, the historical value represents the fiat currency spent on the acquisition of cryptocurrency and gives the asset somewhat 'real-life value. This method seems easy to comprehend as the recorded value would be the same amount that was spent. However, when it comes to assets, their value decreases and increases over time, especially digital assets like cryptocurrency. Therefore, stakeholders would benefit more from fair value representation directly in the balance sheet since then lengthy disclosures might be confusing and misleading. Then again, continuous impairment testing, reversal impairment under IFRS, and unharmonized standardization set numerous gaps in bookkeeping. Thus, stakeholders must read balance sheets and disclosures carefully and interpret the information cautiously.

8 Conclusion

In this paper, current financial reporting standards applicable to cryptographic assets were analyzed to form an objective conclusion about the consequences of unharmonized accounting frameworks. The findings suggest that the accounting of crypto assets depends on various factors, such as the type of cryptographic asset, intention of the holder, business model, contracts, and nature of the transaction. Furthermore, it appears that representing the fair value of the assets is more beneficial to the stakeholders than the booked value, however, reflecting the changes through profit and loss affects the comparability between organizations, additionally, it might lead to artificial taxation obligations and affects the stock prices of the entity.

Concerning cryptocurrencies, the findings suggest that as long as cryptocurrencies are not widely accepted in economies, they are not considered cash or cash equivalents. Hence, it is not appropriate to recognize them as currency in the financial statements. Moreover, they are not recognized as financial instruments, since they do not give the holder the right to receive cash and they do not create a contractual relationship between the holder and the entity. Furthermore, the lack of physical appearance prevents cryptocurrencies

from falling under the scope of investment property and tangible assets. Interestingly, IFRS allows the recognition of cryptocurrencies as inventory when they are held for sale in the ordinary course of business. However, the standard shall be applied strictly in certain cases where the business model involves selling cryptocurrencies.

Theoretically, cryptocurrencies and other cryptographic assets seem to fall under the definition of 'Intangible Assets' of both GAAP and IFRS standards. Initially, according to both standards, intangibles are measured following either cost (booked value) or revaluation (fair value) models. However, GAAP prohibits using the revaluation model in case of an increase in fair value. Moreover, under both standards intangibles are tested for impairment annually or upon triggering an event. Yet, there are differences in the impairment testing between the two standards.

Under GAAP, acquired cryptocurrency is initially recorded at booked value. In case the fair value in the market decreases, the booked value is impaired and the difference is recorded as a loss. Then again, if the fair value in the market is increased in the future, an organization reporting under GAAP shall not record any reversal impairment in its financial statements. As a result, the company's net income is affected and might result in lower taxation obligations during the year of impairment. Due to rules-based standards, GAAP does not allow any room for interpretations. Meanwhile, this prevents any judgments and every company reporting under GAAP must follow the same rules without exception. Consequently, comparability and investor decisions are protected to a certain extent.

Under IFRS, acquired cryptocurrency is also initially recorded at a booked value similar to GAAP standards. However, the difference between the standards lies in the revaluation and impairment testing treatment. IFRS allows reversal impairment in case the fair value of the assets is increased over time. Moreover, IFRS allows the company to decide whether the impairment increase is reported at once or once the asset is sold. As a result, IFRS leaves room for interpretation and allows companies to use their best judgment when executing

impairment losses and profits in the costs. Consequently, net revenue seems to be less altered by the company's impairment testing. However, other companies might treat cryptocurrency holdings differently since IFRS is a standard-based accounting allowing more flexibility than GAAP. Thus, other companies shall have different results making them somewhat difficult to compare from an investor perspective.

Above all, to support the theoretical results of reporting holdings of cryptocurrencies under 'Intangible Assets, the annual reports of two different companies were analyzed in detail. MicroStrategy Inc which reports under GAAP, appear to have inconsistent results in the income statement since they wrote down large impairment losses in cryptocurrency holdings for the year 2021. Meitu Inc which reports under IFRS wrote down impairment losses from Bitcoin but did not record impairment profits from Ethereum, since their policy states that impairment profits are recorded only upon disposal of the asset. Hence, it appears that two companies, holding cryptographic assets reported their holdings differently, leading to speculations about presented financial information which is used for investment analysis and affects the common stock price of the organization.

Current accounting standards can be interpreted in various ways. Amendments to existing financial reporting standards seem to be temporary measures since the rapid development of the crypto market and the increase of their appearance in the monetary system will only cause more gaps in the financial reporting instability. Subsequently, the interpretation of financial information is judgmental and requires cautious studying of the intent and purpose of crypto assets, changes in their holdings, impairment testing method, and last recorded prices in the various markets.

Thus, it appears that once more insights and expertise is acquired, a standalone standard implementation seems to be appropriate. Although it is an expensive and time-consuming process, it still seems to be the only solution to solve investor protection, classification confusion, taxation, monetary policy, financial system stability, and money laundry risks. Moreover, as a result, the

accounting practice would be consistent and harmonized, allowing investors and other stakeholders to compare different companies holding crypto, as well as taxation would be addressed respectfully without creating different and favorable treatment among markets.

However, cryptos' complex nature, lack of underlying intrinsic value, and high volatility delay the development of standardization, regulation, and accounting frameworks, leaving accountants, investors, and all other stakeholders to rely on speculative financial reporting methods and trust their best judgment.

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