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Accounting for digital currencies

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ABSTRACT

The purpose of this paper is twofold: (i) to investigate some of the main issues surrounding the classification of digital currencies, and (ii) to identify the accounting practices and standards tied to digital currencies. This paper discusses two different types of digital currencies, including: central bank digital currencies (CBDCs) and privately issued cryptocurrencies such as Bitcoin. The findings of this study suggest that current accounting standards do not precisely cover the accounting treatment of digital currencies, even though the estimated value of market capitalisation of cryptocurrency in 2022 was USD 200 billion. This conceptual paper identifies the imminent need for an accounting standard to provide guidance on the identification, classification, measurement, and presentation of digital currencies. In the interim, existing accounting standards can be amended to incorporate digital currencies to avoid inconsistent global accounting approaches.

1. Introduction

Digital currency is an unparalleled technological advancement that has received increasing attention from researchers, investors, financial institutions and regulators. It is a mode of exchange that does not have a physical or tangible basis and exists purely in an electronic form. It should not, however, be confused with electronic money such as an online bank account, which shows the amount of cash that is held in a specified account and is linked to a physical currency. Many businesses are now pursuing digital currency as part of their wider financial management system, and this should be appropriately recorded in their financial statements. Despite the rapid increase in the amount and frequency of digital currency transactions, there is no clear guidance from the International Accounting Standards Board (IASB). The classification of digital currencies is a significant issue, and lack of guidance from standard-setters affects the accounting treatment of digital currencies and disclosures in financial statements.

Current literature shows the lack of focus on accounting treatment of digital currencies. In this conceptual paper, we aim to address this literature gap by examining accounting classification and treatment of transactions involving digital currencies. In addition, the paper aims to discuss a number of potential risks associated with the use of digital currencies and lack of clear classifications. Key questions around the classification, reporting and disclosure of digital currencies are addressed in this paper, including: *In what asset class should digital currencies be classified as? and, is there an existing accounting standard for digital currency within the current IFRS*

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standards?

Digital currencies run via a centralised ledger or a distributed ledger technology platform. The best-known example of a distributed technology platform is blockchain. According to the Bank for International Settlements (BIS) (2020), blockchain-based digital currencies can arguably help to improve efficiency and create more secure payment systems, as currencies that run on blockchain are managed by multiple devices all over the world, rather than via one central hub. This system continually verifies the accuracy of a transaction. However, the way blockchain works is not always fully understood by many individuals and organisations wishing to use or already using blockchain technology. This lack of knowledge and understanding could have an impact on the lack of progress in creating globally accepted accounting practices, as well as taxation and regulatory frameworks for digital currencies. This paper also provides a detailed overview of blockchain and the adoption of this technology in accounting systems, which has created a new accounting method termed 'triple-entry accounting'.

The main contribution of this paper is twofold. First, we analyse accounting classifications and treatments of transactions involving digital currencies, and we investigate a number of the significant risks related to the use of digital currencies. Second, we seek to contribute to knowledge and practice by providing a detailed overview of blockchain and the new accounting system, triple-entry accounting. The remainder of this paper is structured as follows: Section 2 describes the main features of central bank digital currencies (CBDCs) and cryptocurrencies, while Section 3 presents various accounting standards and a measurement basis applied to both CBDCs and cryptocurrencies. Section 4 provides a detailed overview of blockchain technology and the triple-entry framework, and Section 5 discusses some current and potential challenges related to digital currencies from an international perspective. Finally, conclusions are reached in Section 6.

2. Digital currencies

2.1. The emergence of central bank digital currency (CBDC)

A widely accepted definition of CBDC has yet to be established. The International Monetary Fund (IMF) defines CBDC as "a new form of money, issued digitally by the central bank and intended to serve as legal tender" (IMF Staff, 2018, p.7). CBDC can be exchanged in a decentralised manner known as peer-to-peer, meaning that transactions occur directly between the payer and the payee without a third party. This distinguishes CBDCs from other existing forms of electronic central bank money, such as reserves, which are exchanged in a centralised fashion between accounts at the central bank (Bech and Garratt, 2017). The number of countries considering launching a CBDC has increased in the past two years, although their CBDC projects are at different stages of development (Atlantic Council, 2021). According to Boar et al. (2020), central banks have been researching the concept and design of digital currencies, with more than 80% of central banks currently actively developing CBDC prototypes.

The main reasons for authorities to issue CBDCs are to meet the evolving needs of financial markets in the digital economy and to ensure an overall stable and sound financial system (Bank for International Settlements, 2018). Following the Covid-19 public health crisis, central banks have been seeking to improve the financial stability and resilience of the payment system. Issuing CBDCs improves the financial stability of central banks by managing liquidity squeezes and offering public alternatives to cryptocurrencies (Deloitte, 2022).

According to BIS (2018), the production of CBDCs can also introduce new financial risks to the market, including but not limited to the hampering of payment systems and monetary policy transmissions, the creation of competition with guaranteed bank deposits, and the misdirection of funds. The privacy and security of CBDCs is imperative. Any digital payment system can be vulnerable to cybersecurity attacks, data breaches and fraud, as it is open to a large number of parties, which ultimately increases the possible points of attack. Panetta (2022) warns that the widespread use of a foreign CBDC raises the risk of financial transactions being based on technologies managed and supervised elsewhere, with little oversight from domestic authorities. This could potentially lead to data breaches and the possibility of misuse of confidential data belonging to individual users, businesses and governments.

2.2. The cryptocurrency market

The European Banking Authority (EBA) defines cryptocurrency (or a 'crypto asset') as a "digital representation of value that is

Table 1
Top 10 Cryptocurrencies in the World.

Digital Currency	Market Cap US$ bn
1. Bitcoin (BTC)	$729
2. Ethereum (ETH)	$330
3. Tether (USDT)	$78
4. Binance Coin (BNB)	$63
5. U.S. Dollar Coin (USDC)	$50
6. Cardano (ADA)	$36
7. Solana (SOL)	$34
8. XRP (XRP)	$30
9. Terra (LUNA)	$21
10. Polkadot (DOT)	$20

neither issued by a central bank or public authority, nor necessarily attached to a fiat currency but is used by natural or legal persons as a means of exchange and can be transferred, stored or traded electronically" (EBA, 2014, p.5). The majority of people have at the very least heard of the most popular type of cryptocurrency – Bitcoin – by name, even if they do not fully understand how exactly it operates. Cryptocurrency is obtained through a process called 'mining', which involves solving cryptographic equations using computers. It is commonly said that the phenomenon of cryptocurrencies first emerged into the public sphere in 2008 with the famous Bitcoin whitepaper of an anonymous person or group called Satoshi Nakamoto (see Nakamoto, 2008). On the subsequent release of Bitcoin to the public, more people began creating Bitcoins (Marr, 2017). Bitcoin remains the most widely recognised and most commonly used cryptocurrency. Currently, there more than 12,000 different cryptocurrencies are traded or listed on various crypto-exchanges (EY, 2021), but only a few had recorded significant market capitalisation. Table 1 shows the top 10 digital currencies based on their market capitalisation as of 1 February 2022, according to Coinmarketcap, 2021.

Bitcoin is considered as a first-generation cryptocurrency. In the second generation, the basic transactions from first-generation cryptocurrencies developed into complete computer programs that were stored on the blockchain. In this generation, a new type of cryptocurrency altogether was created, entitled Ethereum. This enabled smart contracts and decentralised applications (Reiff, 2021). A cryptocurrency is different to a CBDC in that a CBDC is produced by a central bank for public use, while cryptocurrencies are private non-regulated currencies which are not linked to a government or central bank and rely on cryptographic methods to maintain security and verifiability. Cryptography is also used to manage and control the creation of such currencies (Frankenfield, 2022). It is noteworthy that while the value of cryptocurrencies can rise and fall very quickly, CBDCs are more secure and less volatile (Deloitte, 2021). Moreover, while cryptocurrency users have anonymity when conducting transactions via the network, CBDCs are linked to a user's existing bank account, which traditionally has their personal information attached.

Recent research has highlighted advantages of using cryptocurrency, such as lowering transaction costs, increasing operation speed, improving the efficiency of payment systems and increasing compatibility with modern mobile payment systems (Houben and Snyers, 2018; Renterghem and Meerleer, 2017; Lee et al., 2018). Conversely, disadvantages of cryptocurrency include the possibility of anonymity increasing the risk of illegal activity using cryptocurrencies, high energy-consumption and environmental costs, high volatility, the risk of losses, and regulations being implemented to potentially ban or restrict the usage of cryptocurrencies, as well as cybersecurity-related issues (Spenkelink, 2014; Rose, 2015; Foley et al., 2018). At the same time, some supposed disadvantages of cryptocurrency can in fact be advantageous in certain conditions and vice versa. For example, the decentralised nature of cryptocurrency provides a trust-free environment in which no party is required to know or trust any other party in the network, as each user has their own identical copy of the ledger. Any changes that are made to this ledger will therefore be reflected in all of the copies simultaneously and be visible to all users.

3. Accounting classification of digital currencies

Currently, there are no clear or universal accounting standards or classifications for digital currencies. The lack of clear classifications for digital currency in accounting could certainly have a detrimental effect on the usefulness of the financial information it provides, thereby affecting the decision-making processes of financial report users. A non-stringent accounting treatment could also increase the uncertainty cost for both accounting firms and the financial markets. Another issue is the high degree of subjectivity associated with digital currencies, which can lead to a greater use of professional judgement. This is potentially problematic, as the use of judgement in accounting can create opportunities for companies to choose those accounting methods that increase the profits of the company or the value of accounting. As a result, this can both impair stakeholders' ability to accurately evaluate a company's revenue and increase the likelihood of earnings management. Earnings management refers to a company's use of accounting practices to manipulate earnings and thus make the financial position of a company look stronger than it is. This section provides guidance on accounting treatments regarding CBDCs and cryptocurrencies, according to what has been suggested by public authorities and professional accountants in public practice.

3.1. Accounting classification of CBDC

There are currently no accounting standards that specifically address accounting practices for CBDC. Differing opinions on which International Financial Reporting Standards (IFRS) should apply to digital currency accounting have been expressed. According to the Australian Accounting Standards Board (AASB), digital currency meets the definition of assets. An asset is defined by the IFRS as a resource controlled by an entity as a result of past events, and from which future economic benefits are expected to flow to the said entity. Under assets, the most obvious classification for digital currencies is 'cash'. There are, however, significant arguments against classifying digital currencies as cash. One argument is that CBDC does not meet the definition of cash according to the IFRS, which is the most common accounting framework used by central banks. The IFRS define cash in the IAS 7 Statement as "cash on hand and demand deposits". However, this definition could be amended in the future to include CBDC or any other cryptocurrency. Another argument against classifying CBDC as cash is the existence of both positive and negative interest charges on CBDC, as cash does not accrue interest with the issuer. On the other hand, there is a 'substance over form' argument that could be applied here. If users were to consider CBDC as a type of cash, and the intention of the issuer were for CBDC to act as an equivalent of cash, then this would be sufficient for digital currencies to be classified as cash (Darbyshire, 2020).

The IFRS' definition of a 'financial instrument' could also arguably be applied to CBDC. In the IAS 32 Statement, the IFRS define a financial instrument as "any contract that evidences a residual interest in the assets of an entity after deducting all of its liabilities" (IAS 32.11). One problem with this, however, is that there is no contractual relationship in CBDC that results in a financial asset for one

party and a financial liability for another. This difference would thus need to be legally clarified in order for CBDC to be classified as a financial instrument. Moreover, some CBDC papers suggest that CBDC is more likely to be classified as a 'security', as it trades at a premium or a discount. This in turn generates a whole new set of accounting issues relating to whether CBDC qualifies as a cash equivalent. The existence of these different possible interpretations of the accounting standards in relation to digital currency thus highlights the need for greater global consensus and clarity on accounting practices for digital currencies.

3.2. Accounting classification of cryptocurrencies

Given the significant trading volume of cryptocurrencies, digital currencies are clearly a matter which require the attention of accounting standard-setters. In February 2022, the total market capitalisation of cryptocurrencies was estimated at around USD 200 billion, although this is down significantly from its peak in November 2021, when the total capitalisation of the crypto market nearly reached USD 300 billion (DeMatteo, 2022). The current financial reporting standards do not provide a clear definition of or any guidance on the matter of cryptocurrencies. This lack of applicable IFRS guidelines for cryptocurrencies resulted in different accounting practices being employed globally. The existing guidelines include an agenda decision by the International Financial Reporting Interpretations Committee (IFRIC), an interpretation issued by the AASB and reports issued by the big accounting firms. The IFRIC agenda decision, which was issued in June 2019, states that cryptocurrencies should be classified as an intangible asset within the scope of 'IAS 38 Intangible Assets'. The agenda also supplied disclosure requirements relating to cryptocurrencies in financial statements. Currently, no IFRS standard exist for cryptocurrencies, meaning that there continues to be a lack of uniform accounting practices for how to handle them in financial statements. A report by EY (2021) noted that the IASB has yet to issue any new standards for cryptocurrencies, although it does continue to monitor the development of cryptocurrencies.

The continued absence of generally accepted accounting principles (GAAPs) for cryptocurrencies has led to the issue of the appropriate classification of cryptocurrencies becoming an important topic of discussion in scholarship on the subject (Raiborn and Sivitanides, 2015; Tan and Low, 2017; Procházka, 2018). According to Procházka (2018), cryptocurrencies can fall into multiple categories – assets, cash, inventory or investment – depending on the purpose of acquisition. Some researchers have suggested that cryptocurrency falls into the category of assets and can be classified as 'cash' (according to the IAS 7 Statement of Cash Flows, 1994), 'inventory' (IAS 2 Inventory, 1991), 'financial instruments' (IFRS 9 Financial Instruments, 2018) or 'intangible assets' (IAS 38 Intangible Assets, 2004). However, in its report (2020), the Association of International Certified Public Accountants (AICPA, 2020) disagreed with the cash classification for cryptocurrency on the basis that it is not considered legal tender and is not backed by a jurisdictional authority or another party. The Association has also stated that cryptocurrency does not seem to meet the definition of a financial instrument or a financial asset because it does not represent cash. Moreover, the regulators, like central banks, have strongly disagreed with the cash classification of cryptocurrency, as it does not comply with their definition of money (ECB, 2015).

As per the literature review, 'intangible asset' seems to be the most appropriate classification for cryptocurrency. The 'Big Four' accounting firms make the same assertion but make a distinction between the accounting and tax treatment of cryptocurrency. Deloitte (2018) and KPMG (2018) state that cryptocurrencies likely meet the definition of an intangible asset for accounting purposes and meet the definition of property for tax purposes. It should be noted, however, that according to the GAAPs, an intangible asset is recorded at historical cost and reviewed at least annually for any impairment. Using the cost model for cryptocurrency may therefore not accurately reflect the actual economic value for a company if the cryptocurrency is held as an investment and rapidly increases in value. The AASB has therefore stated that digital currencies should be measured at fair value, with changes in fair value recognised in profit or loss. According to this view, the best accounting practice for cryptocurrency would be treating it as a 'fair value' financial asset (Zubir et al., 2020). Indeed, Procházka (2018) concurs with this view and claims that the fair value approach would make accounting information more relevant for users of financial statements when cryptocurrencies are acquired for investment purposes. Table 2 provides a summary of the suggested accounting treatments for cryptocurrencies.

4. The technology behind digital currencies

4.1. Blockchain and financial reporting?

Digital money itself is not new to modern economies, but it has only recently received an appropriate technology platform. The majority of digital currencies are built on the foundation of a technology called 'blockchain'. Blockchain technology can be defined as a distributed digital ledger that records transactions and transfers value between two parties directly without the need for third-party verification via "middlemen" (Treiblmaier, 2018). While blockchain was initially designed specifically for digital currency and for advancing the objectives of digital currencies more broadly, it has also emerged as a solution that eliminates the need for inter-party

Table 2
Potential Accounting Treatments for Cryptocurrencies.

Applicable Standard	Category
IAS 7 Statement	Cash and cash equivalent
IAS 39 Financial Instruments	Financial assets
IAS 38 Intangible Assets	Intangible assets

trust that traditional institutions require. By reducing the involvement of traditional financial institutions, the overall costs and time associated with conducting transactions through regular banks and financial institutions can be reduced (Dai and Vasarhelyi, 2017).

Blockchain has five main features: distribution, security, transparency, a consensus-based system and flexibility. Data in blockchains is immutable, making it impossible for any user to manipulate or falsify the stored data. The fact that blockchain provides a distributed-decision 'consensus mechanism' ensures greater trust in transactions. In the blockchain ledger, decisions in the system are made by a large majority of the system's users, rather than by a system controller, as is the case in centralised systems. As the database is shared and decentralised to all network participants, it is not possible to manipulate the recorded transactions in the blockchain (Keogh et al., 2020). It should be noted, however, that there are still a number of issues that need to be addressed in relation to blockchain, such as its security, scalability, regulations, complexity and energy consumption. Fig. 1 below illustrates how blockchain technology works.

Although blockchain was originally developed for recording cryptocurrency transactions, it is currently being used by a number of different organisations in various spheres of business, such as in supply chains, logistics, intellectual property management, healthcare data management, food safety and notarisation. Swan, (2015) identifies three categories or stages of Blockchain applications: stage 1 ('digital currency') mainly entailed the creation of applications which enabled Bitcoin and digital cryptocurrency transactions; stage 2 ('digital economy') involved the creation of smart contacts as well as a set of applications which went beyond cryptocurrency transactions to cover mortgages, bonds, loans and futures; and stage 3 ('digital society') involved the creation of applications in areas beyond what was covered by the previous two phases, such as in government, health, science and IoT (the Internet of Things) culture, art, and literacy.

In addition, according to the existing literature, blockchain permissions can be divided into three main categories, too: public blockchains (permissionless), private blockchains (permissioned) and federated blockchains (a combination of public and private). Public blockchains are completely open and all users can access, view and perform operations. The main application of public

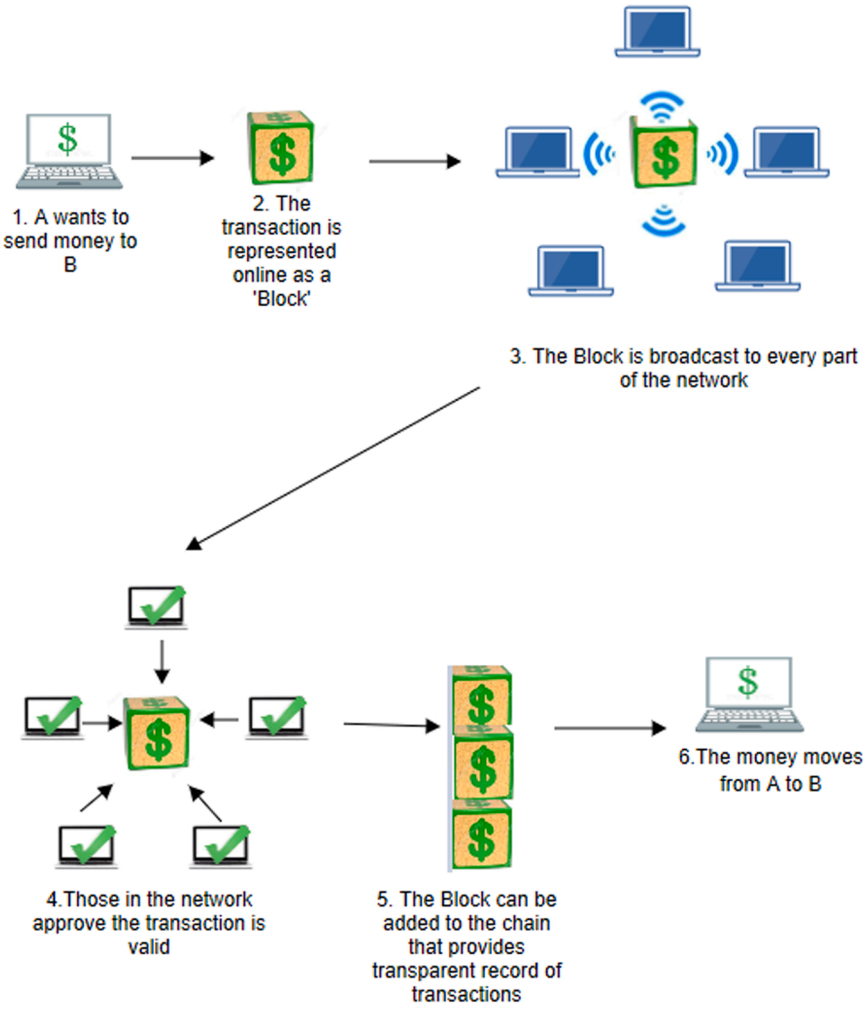

Fig. 1. How Blockchain Works?
Adapted from – Sarmah (2018).

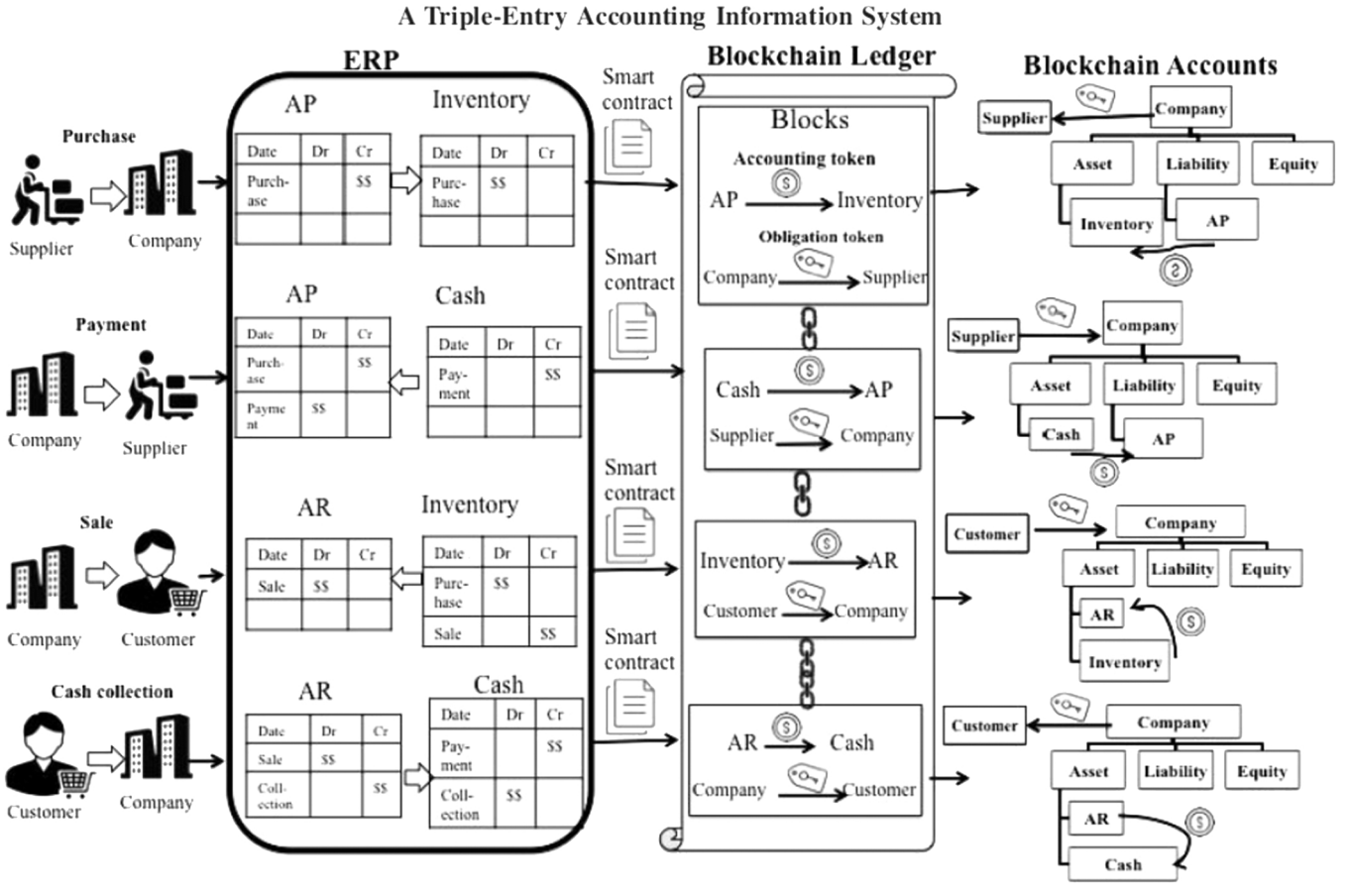

Fig. 2. Triple-entry accounting system.
Adapted from – Toward Blockchain-Based Accounting and AssuranceSource: Dai, Jun; Vasarhelyi, Miklos (2017).

blockchains has been cryptocurrencies such as Bitcoin. In contrast, only select parties can be assigned specific authorities in private blockchains, and only authorised users can add transactions to the blockchain (Dai and Vasarhelyi, 2017). This underlines why private blockchains seem more appealing to companies; this option does not require businesses to publicise their transactions. However, it is important to note that private blockchains rely on the integrity of their users, as they depend on users not colluding to create false transactions.

In the field of accounting specifically, blockchains are increasingly being viewed as a technology that could potentially be used for recording, storing and reporting financial transactions. Indeed, the viability of blockchain technology for recording accounting transactions has been widely identified by experts. Yu et al. (2019), for example, have suggested that blockchains could be used by parties in the short term to voluntarily disclose non-confidential information such as earnings forecasts and corporate social reports, while, in the long term, blockchain technology could be used as an accounting ledger to disclose companies' financial information in order to enhance the quality of the information available for accounting purposes and to reduce information asymmetries. The possible benefits of using blockchain in accounting can include lowering transaction costs, removing the need for data reconciliation, improving operation efficiencies, decreasing risk of fraud, providing users with timely accounting information and ensuring faithful representation in financial reports (Dai and Vasarhelyi, 2017; Faccia and Mosteanu, 2019; Kamble et al., 2020).

4.2. Triple-entry accounting- a paradigm shift in the accounting world

The term 'triple-entry accounting' is used by researchers to explain a new accounting method which is an improvement on the traditional double-entry system. The triple-entry approach was originally put forward by the financial cryptographer Ian Grigg in his working paper 'Triple-Entry Accounting' in 2005. Grigg proposed that a third entry – a digitally signed receipt – should be added to accounting systems as a solution for stopping transaction errors and fraud (Grigg, 2005). While it was not initially clear which platform would be used for the third entry in Grigg's system, blockchain technology was later found to be ideal for Grigg's concept on the basis that the technology is decentralised, immutable and secure. The third entry in blockchain accounting is thus both a transaction and an invoice which gets entered into the blockchain (Pedreño et al., 2021). This proposed method arguably overcomes the limits of double-entry bookkeeping, such as the possibility of fraud and the need for external assurance on companies' financial statements.

Double-entry accounting, which has been used for more than 600 years (Cai, 2021), revolutionised accounting methods and is considered to be the most significant breakthrough in enterprise and commerce to this day. The single-entry system was based on an asset list, with the assets being entered and crossed off as they were moved in and out of a company. The limitations of this system are obvious: errors are not easily detectable, and fraud is easily committed. This was overcome by the double-entry system, in that there is a trail for every transaction, assets and liabilities have to be balanced, and parties access debit and credit reports separately through their own accounts. The main limitation of the double-entry system, however, is that it can be falsified almost as easily as the single-entry system, because it relies on proof or verification of each transaction. Moreover, the double-entry system also needs to be audited on a regular basis in order to maintain public trust. While this ensures the accuracy and consistency of corporate data over time, it comes at a high labour and time cost.

In contrast, the triple-entry blockchain system (as is illustrated by Fig. 2) requires transactions to be recorded in three different ledgers by both participating parties, as well as in a common ledger, with accounting entries also being time-stamped (Dai and Vasarhelyi, 2017). On the completion of a transaction in the system, a receipt is automatically generated using the users' digital signatures, with each user having a unique and non-transferable digital signature. Transactions in the triple-entry system can therefore be easily proved by matching them against the other parties' receipts, with the cryptographic signature providing clear evidentiary support for the receipt. This system can reduce fraudulent activities, increase internal control and add a new level of clarity to the accounting system that double entry cannot offer.

5. Risk factors related to the growth of digital currencies

Digital currencies pose challenges across a vast range of areas, including economy, taxation and financial regulation. This is because of their complexity and their technological features, which are rapidly evolving. This section discusses a fraction of the challenges and effects related to the use of digital currencies alongside the lack of distinct accounting classification of them.

5.1. Impact on the economy

There are still a number of unanswered questions about the impact of digital currencies on financial, economic and environmental stability (Elsayed and Nasir, 2022). A report by the Atlantic Council (2021) states that the financial system may face a significant interoperability problem in the near future as a result of the increased use of CBDCs. Customers could withdraw too much money from banks at once in order to purchase CBDCs, thereby triggering a run on the banks which affects their ability to lend, sending a shockwave through the market and affecting interest rates (Atlantic Council, 2021). This is a problem in particular for countries with unstable financial systems. CBDCs also carry operational risks, since they are vulnerable to cyberattacks and need robust security mechanisms to combat any potential attacks launched by cybercriminals.

Moreover, there are some concerns that privately issued cryptocurrency might negatively impact the global economy, particularly the economies of developing countries, as it removes the need for intermediaries such as banks. It has been argued that the extreme volatility of cryptocurrency and the lack of a regulating authority could negatively affect the economy. For example, the Bank of Russia believes that the current scale and further spread of cryptocurrency mining in the Russian Federation entails significant risks for the

economy and financial stability (Bank of Russia, 2022). The Bank of Russia further states that non-state-based currencies pose a threat to citizens' well-being through the loss of investments due to market volatility, scams and cyberattacks. On the other hand, however, it has also been argued that cryptocurrency could support the financial inclusion of poorer countries in the global economy at a previously unmatched rate, owing to the low cost associated with transactions, its ability to beat inflation if it is held as a store of value, and the increased transparency during transactions it provides through the decentralised ledger system.

5.2. Lack of regulations

Despite the exponential growth of digital currencies, there are currently no specific regulations in place to verify and control the transactions completed using these currencies. This is further complicated by the fact that the state of digital currencies substantially differs from country to country, with the use and regulation of them remaining undetermined in a large number of countries (Jacobs, 2018; Tran, 2021). For example, while certain countries, such as China, have opposed the use of them because of the highly speculative investments they enable, others have recognised Bitcoin and other cryptocurrencies as a payment unit (Fomina et al., 2019).

While many cryptocurrency enthusiasts oppose the issuing of new regulations because they believe it will hinder innovation and pose a threat to the decentralisation which is at the heart of cryptocurrency, others believe that the lack of a legal framework in fact hinders the development of cryptocurrencies, as potential investors might be discouraged from investing in cryptocurrencies because of this. The distinctive characteristics of cryptocurrency (decentralisation and anonymity) provide an opportunity for money laundering and other illegal activities (Dyntu and Dykyi, 2019), as the decentralised nature of cryptocurrency blockchains makes it difficult for authorities to track down criminals.

A critical issue central to the regulation of digital currencies is how these currencies are reflected in accounting. The development of a transparent and verifiable regulatory framework can significantly help the creation of accounting standards for digital currencies. Digital currencies require a robust regulatory framework that takes important factors such as privacy, consumer protection and anti-money-laundering standards into consideration. These areas have to be augmented to counter the ever-evolving threats, to protect investors and increase investor confidence, and to provide additional financial stability in the volatile crypto market.

5.3. Taxation matters and digital currencies

The issuance of digital currencies will naturally raise questions regarding tax law. The main question which needs to be asked is how digital currencies' gains and losses affect a company's cash taxes and book taxes. A further issue is the question of how the taxation of a cryptocurrency can work if little or no accurate information has been provided regarding the parties involved in transactions. The existence of digital assets outside of the traditional financial system might, for instance, lead some cryptocurrency investors to question whether their activities are in fact taxable.

Unlike accounting standard-setters, taxation authorities have issued guidelines on how cryptocurrency could be treated for accounting and taxation purposes. Some countries have issued guidance regarding the treatment of digital currencies for tax purposes, while others coun tries have not yet developed comprehensive guidelines for the treatment of these currencies. For example, cryptocurrencies are currently taxed in the UK, the US, Italy, Germany and Canada. To understand the taxability of cryptocurrencies, we need to determine the classification of cryptocurrency. In the US, the Internal Revenue Service classifies cryptocurrencies as 'property', not currency, for the purposes of tax. This means digital currency is taxed in the same way as any other asset, like stocks or gold. In Italy, the tax authorities classify cryptocurrencies as foreign currency. Therefore, income generated from cryptocurrencies to fiat currencies is subject to a standard 26% substitutive tax rate (OECD, 2020).

The relative flexibility offered by tax authorities aims to make the taxation of cryptocurrencies less complex and could encourage more companies to pay taxes. At the same time, this flexibility can have the disadvantage of increasing the number of different taxation and accounting practices used for cryptocurrency. Moreover, individuals can have multiple accounts in different exchanges in different tax jurisdictions, and even an independent account may have multiple revenues that cross over various international tax regulations. Thus, the information regarding the capital gains from cryptocurrency is limited, as data may not reflect an individual's global assets because of the lack of consistency across the tax laws (Thiemann, 2021).

In addition, it could be argued that blockchain, the underlying technology of cryptocurrencies, can be used to improve the tax system. This is beacuse blockchain technology suits transaction taxes, as it provides information that has more detail, more visibility and more certainty. According to PWC, 2016, blockchain could be applied in a number of areas to reduce the administrative burden and collect tax at a lower cost, helping to narrow the tax gap. Likewise, Demirhan (2019) suggests using the technology to improve tax collecting, since it offers greater transparency and traceability, as every network member in a blockchain database has access to the entire database of transactions.

6. Summary and conclusion

Digital currencies represent a genuinely new development in the landscape of financial payments. The main issue is that there are currently no clear or universal accounting standards or classifications for digital currencies. It is critical that blockchain technology, regarded as the underlying technology of most digital currencies, is fully understood, in order to be able to create relevant accounting and taxation standards as well as regulatory frameworks. Blockchain could therefore positively impact business models due to its unique characteristics, which address a number of key business issues. In addition, it offers the possibility of 'triple-entry accounting', in which accounting entries are cryptographically sealed by a third entry and made accessible to all third parties. Furthermore,

blockchain accounting can reduce errors in disclosure and earnings management, improve the reliability and timelines of accounting information, and accordingly mitigate information asymmetry.

Accounting standard setters seem to be struggling to cope with the exponential growth in digital assets, which has led to a lack of consensus among them about how to treat these assets. This demonstrates that there is an urgent need for clear guidance to be issued by the standard-setters, as this absence has hindered the development of a universal accounting practice for digital currencies and has thus posed a number of challenges for authorities in relation to the classification and measurement of digital currencies.

Even in the event of a new standard being established, however, there remains a need for future research to address a number of the issues related to the accounting of cryptocurrencies. This includes questions such as how companies can properly report transactions associated with cryptocurrencies, how cryptocurrencies are recognised and measured in businesses' financial statements, and how these measurements will affect the quality of financial reporting. Further research is also required to address the question of how auditors can identify the extent and risks of digital currency transactions during audit-planning and evidence-gathering. This is necessary in order to provide reasonable assurance that financial statements will be free of material misstatement.

To conclude, as accountancy fundamentally revolves around financial transactions, any increase in the use of digital currencies by businesses, individuals or governments is likely to have significant implications for the accounting profession. It is therefore critical that accounting professionals learn more about cryptocurrencies and their technological features, as well as about the new issues that have arisen in accounting in relation to the recording and reporting of cryptocurrency. Deloitte (2018) has stressed the importance of accountants gaining further knowledge and understanding of the various possible accounting treatments of cryptocurrency and its underlying technology in order to ensure that it is handled correctly. There are therefore new opportunities in the cryptocurrency era for accounting practitioners to offer professional services such as consulting for digital currencies or technology consulting in the field of accounting and auditing (Smith, 2018).

CRediT authorship contribution statement

Miss Noora Alsalmi: draft preparation. **Dr Subhan Ullah**: Conceptualisation, Supervision, Writing – review & editing. **Dr Muhammad Rafique**: Conceptualisation, Supervision, Writing – review & editing.

Data Availability

No data was used for the research described in the article.

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