

Taxing Virtual Currencies

An Overview of Tax Treatments and Emerging Tax Policy Issues

OECD

BETTER POLICIES FOR BETTER LIVES

Taxing Virtual Currencies: An Overview of Tax Treatments and Emerging Tax Policy Issues



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Foreword

Crypto-assets, and virtual currencies in particular, are in rapid development and tax policymakers are still at an early stage in considering their implications. Against this background, G20 Leaders and Finance Ministers have asked international organisations to analyse the risks posed by crypto-assets. To date, the tax policy and evasion implications have been largely unexplored, although they form an important aspect of the overall regulatory framework.

Prepared and endorsed by the 137 members of the OECD/G20 Inclusive Framework on BEPS, *Taxing Virtual Currencies: an Overview of Tax Treatments and Emerging Tax Policy Issues* provides a comprehensive analysis of the approaches and policy gaps across the main tax types for more than 50 jurisdictions. It covers the key concepts and definitions of blockchain and crypto-assets, looking at the characterisation, legality and valuation of virtual currencies and analysing the tax consequences across the different stages of their lifecycle, from creation to disposal. The report also identifies key tax policy considerations and provides an overview across countries of the tax treatment of virtual currencies from the perspective of income, consumption and property taxation.

The report also analyses the tax policy implications of a number of emerging issues related to the taxation of virtual currencies, including the rise of stablecoins and 'Central Bank Digital Currencies'; as well as the evolution of the consensus mechanisms used to maintain blockchain networks (e.g. the increasing use of Proof-of-Stake rather than Proof-of-Work) and the rise of decentralised finance.

Finally, *Taxing Virtual Currencies* also highlights a number of key insights that policymakers may wish to consider in strengthening their legal and regulatory frameworks for taxing virtual currencies, thus improving certainty for tax administrations and taxpayers:

- Providing clear, regularly updated guidance and legislative frameworks for the tax treatment of crypto-assets and virtual currencies, which considers consistency with the treatment of other assets and remains abreast of emerging areas;
- Supporting improved compliance, including through the consideration of simplified rules on valuation and on exemption thresholds for small and occasional trades;
- Aligning the tax treatment of virtual currencies with other policy objectives, including regarding the use of cash and environmental considerations;
- Developing appropriate tax guidance in response to emerging technological developments, including stablecoins, Central Bank Digital Currencies, Proof-of-Stake and decentralised finance, for which existing frameworks may not be appropriate.

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1 Introduction and key concepts

1.1. Introduction

1.1.1. Context – G20 communiqués and OECD interim report on the tax challenges arising from digitalisation

Digital financial assets based on distributed ledger technology (DLT) and cryptography – referred to in this report as "crypto-assets" – have emerged as an important issue for policymakers since their creation in 2009 and their subsequent growth and increasingly widespread use. Crypto-assets, for which no uniform definition exists, and which span a vast spectrum of heterogeneous forms and purposes, have a number of inherent and unique characteristics that pose challenges for policymakers. These challenges arise due to their lack of centralised control, (pseudo-)anonymity, valuation difficulties, hybrid characteristics including both aspects of financial instruments and intangible assets, and the rapid evolution of the underpinning technology as well as the form of these assets.

The policy challenges posed by crypto-assets – including within this category "virtual currencies" based on DLT, which represent an overall market capitalisation of USD 346 billion as of September 2020[1] – are attracting increased attention at the political level, including by Finance Ministers and Central Bank Governors, some of the latter being in the process of considering the creation of central bank backed digital currencies ("CBDCs"). The importance of improving regulation of crypto-assets has also been consistently called for by the G20 since 2018:

- At the Leaders' level, the first reference to the need to address the policy challenges posed by crypto-assets was made at the December 2018 Buenos Aires G20 summit: "We will regulate crypto-assets for anti-money laundering and countering the financing of terrorism in line with FATF standards and we will consider other responses as needed".[2] The need to consider the tax evasion risks raised by virtual currencies had previously been explicitly mentioned in the communiqués of the G20 Finance Ministers' meetings in March[3] and July[4] 2018.
- The G20 Leaders' declaration arising from the June 2019 Osaka Summit also mentions the need to address the policy risks of crypto-assets, and stated that: "While crypto-assets do not pose a threat to global financial stability at this point, we are closely monitoring developments and remain vigilant to existing and emerging risks. We welcome on-going work by the Financial Stability Board

[1] https://coinmarketcap.com/all/views/all/

[2] http://www.g20.utoronto.ca/2018/2018-leaders-declaration.html

[3] https://www.mof.go.jp/english/international_policy/convention/g20/180320.htm

[4] https://www.mof.go.jp/english/international_policy/convention/g20/20180722.htm

(FSB) and other standard setting bodies and ask them to advise on additional multilateral responses as needed".[5]

- Finally, at the most recent G20 Finance Ministers' meeting on 17-18 October 2019 in Washington D.C., the policy implications and risks of stablecoins – another form of virtual currency – were noted in a special press release.[6] While the press release does not explicitly refer to taxation, it states that G20 Finance Ministers "agree that global stablecoins and other similar arrangements with potential systemic footprints give rise to a set of serious public policy and regulatory risks" and that the risks posed by virtual currencies "need to be evaluated and appropriately addressed".

The G7 has also showed interest in the issues raised by virtual currencies and in 2019 the G7 French Presidency created a G7 Cryptocurrency Task Force to study how central banks can ensure that virtual currencies are effectively governed by regulations ranging from money-laundering laws to consumer-protection rules.

Whereas the FSB and the Financial Action Task Force (FATF) are both working on financial stability implications and on the anti-money laundering and counter terrorism financing (AML/CFT) issues related to virtual currencies, the importance of the tax implications of virtual currencies was already identified as part of the OECD's work on tax and digitalisation. In the context of the OECD/G20 Base Erosion and Profit Shifting (BEPS) project, the 2015 BEPS Action 1 Report (OECD, 2015[1]) identified virtual currencies among the developments contributing to the digitalisation of the global economy and encouraged policymakers to monitor these closely to address the additional tax policy challenges that they may generate. In March 2018, the Inclusive Framework on BEPS issued *Tax Challenges Arising from Digitalisation – Interim Report 2018* (the Interim Report) (OECD, 2018[2]), which was presented to the G20 Finance Ministers, noted the importance of the tax evasion risks associated with virtual currencies and indicated that further work would be needed in this area.

1.1.2. Tax policy challenges raised by distributed ledger technology

Applications based on distributed ledger technologies like blockchain, pose challenges for policymakers in a wide range of areas, including in tax policy. The use, trade, and level of market capitalisation of these assets has been increasing and their technological features are rapidly evolving, posing challenges for tax administrations and policymakers.

Some countries have started to respond to these challenges by issuing guidance on the treatment of crypto-assets. However, in most countries, and in the emerging academic literature, there is often a lack of comprehensive guidance or a framework for the treatment of these assets for tax purposes, with any guidance generally being partial or incomplete. This lack of guidance may be driven in part by the complexity of defining the tax treatment for these assets in a way that covers their different facets, as well as their rapidly changing nature.

Key tax questions raised by crypto-assets to be considered by governments may include:

- How should the income created by crypto-assets be treated for direct and indirect tax purposes?
- If considered to be property, should the stock of crypto-assets be included in countries' net wealth taxes (where they exist) or other capital taxes? If so, how should they be valued?
- How should VAT systems treat the creation, acquiring, holding and transfer of these assets?
- What are the policy implications of the different tax treatments available?

[5] https://www.g20.org/pdf/documents/FINAL_G20_Osaka_Leaders_Declaration.pdf
[6] https://www.mof.go.jp/english/international_policy/convention/g20/g20_191018sc.htm

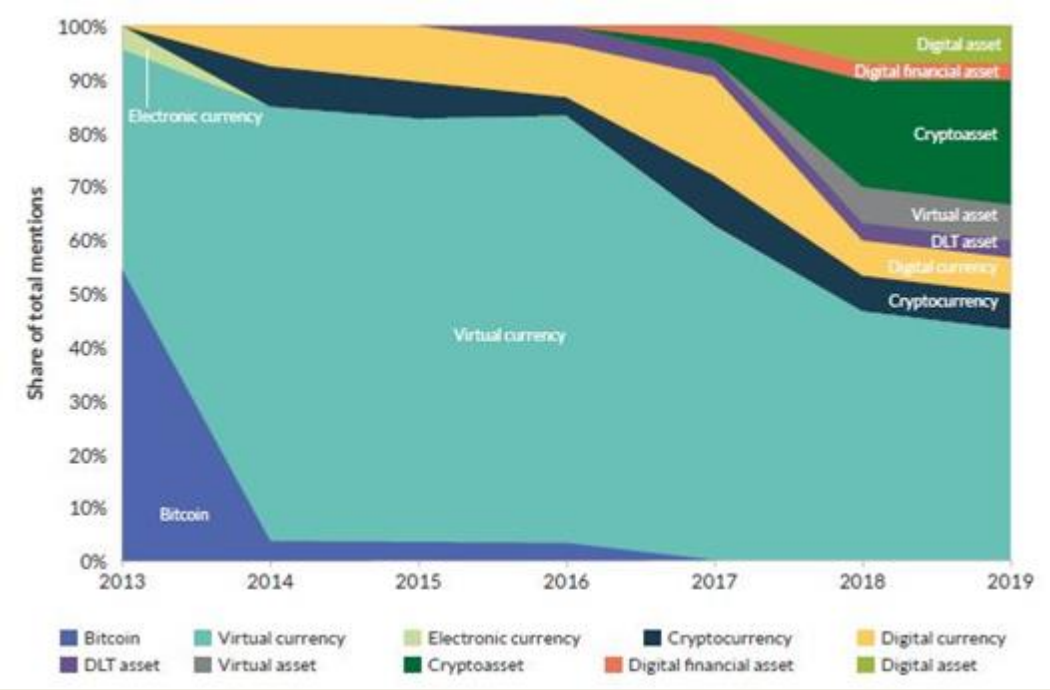
- How can governments effectively detect and address the risks of tax evasion and other financial crimes posed by crypto-assets, including what are the existing legal frameworks and tools that tax administrations can use?
- How to improve tax transparency, including what information tax administrations need to know about transactions for purposes of compliance and enforcement? In addition, the OECD is addressing the need for greater tax transparency in this area, in particular in light of the tax compliance risks posed by crypto-assets. In this respect, the OECD is currently developing technical proposals in order to ensure an adequate and effective level of reporting and exchange of information with respect to crypto-assets.

Box 1.1. Terminology used in this report

The expression 'crypto-assets' is commonly considered by regulators and researchers to cover three main categories of digital financial assets that are based on distributed ledger technology (DLT). These categories are payment tokens (also known as cryptocurrencies or virtual currencies), utility tokens and security tokens, as described in Section 1.2.1.

The terminology used to describe "payment tokens" – i.e. tokens that are based on DLT and aim to operate as a unit of account and means of payment – also varies significantly among countries and over time. The University of Cambridge indicates that at least ten different expressions were used in regulatory statements to describe this type of token between 2013 and 2019 (Cambridge Centre for Alternative Finance, 2019[3]). Figure 1.1 shows that the use of the expression "virtual currency" increased from being used in 40% of official publications and statements in 2013 to nearly 80% in 2016. While a few other terms have been introduced more recently, "virtual currency" remains the most widely used, in almost 50% of cases.

Figure 1.1. Evolution of the terminology used by regulators



Note: This chart is based on terminology used by regulators from 23 selected jurisdictions as well as selected international organisations.
Source: Cambridge Centre for Alternative Finance (2019), Global Cryptoasset Regulatory Landscape

As explained in Section 1.2.5, “virtual currencies” are not considered as similar to fiat currency in most countries – the official, sovereign currency being legal tender. In light of this, the expression “virtual currency” can be misleading and therefore, the expression “payment tokens” is more precise. However, for the sake of simplicity, and given that it is the most widely-used and understood term, “virtual currency” is used throughout this report.

Virtual currencies are the most widely-known forms of crypto-asset and include the very well-known Bitcoin as well as Ethereum. The term “virtual currency” also includes more recently developed forms of payment tokens that are backed with real assets (e.g. securities or fiat currencies), which aim to be more stable and that are therefore called “stablecoins” – these are discussed in Section 3.2.1. Finally, another evolution of virtual currencies is the concept of a “central bank digital currency” (CBDC), which would be backed by public authorities and which is under consideration in a number of countries to provide an alternative to other forms of virtual currencies – explained in Section 3.2.2.

1.1.3. Objective of the report

This report analyses the different characterisations of crypto-assets for tax purposes. It uses information collected via a questionnaire to identify the different approaches to the taxation of crypto-assets, and particularly virtual currencies, under income taxes, VAT and property taxes. The report focuses on the treatment of virtual currencies in particular as these are the most prevalent form of crypto-asset in the marketplace and the most commonly discussed in country tax systems. They were also the focus of the questionnaire. Finally, the report also considers particular challenges and emerging issues in the area of virtual currency taxation, including hard forks, the development of stablecoins and central bank digital currencies and the increasing use of proof of stake protocols, driven by both environmental and security considerations. The report also includes a number of key insights for the consideration of policymakers. These considerations are not intended as recommendations or best practices, since the purpose of the report is to make observations about the current tax treatment of virtual currencies in various countries.

1.2. General concepts and definitions

1.2.1. Blockchain and classification of crypto-assets

Crypto-assets, a catch-all term for digital financial assets based on distributed ledger technology (e.g. blockchain) which includes so-called virtual currencies such as Bitcoin, have gained growing attention from regulators since their inception in 2009. There is currently no internationally agreed standard definition of crypto-assets, although the FATF defines a ‘virtual asset’ as “a digital representation of value that can be digitally traded or transferred, and can be used for payment or investment purposes.” (Financial Action Task Force, 2019[4]). Given the lack of a common definition, regulators and international standard-setting bodies tend to use their own terminology and definitions. Nevertheless, the term crypto-asset is commonly used to refer to types of digital financial assets that are based on distributed ledger technology (DLT) and cryptography as part of their perceived or inherent value.

While these two elements are considered to be necessary in any definition of crypto-assets, there is a question over whether it is sufficient to qualify assets possessing these properties as crypto-assets. Authorities such as the International Monetary Fund (IMF), the European Banking Authority (EBA) and the European Securities and Markets Authority (ESMA) generally consider every asset based on DLT to be a crypto-asset. In contrast, the European Central Bank (ECB) only considers assets recorded in digital form that are not and do not represent either a financial claim, a financial liability, or a proprietary right as a crypto-asset. See (European Banking Authority, 2019[5]): (European Securities and Markets Authority, 2019[6]) (ECB Crypto-Assets Task Force, 2019[7]) (International Monetary Fund, 2020[8])

Driven initially by a view that the traditional financial system was closed and that means of payment should be easier to develop and access, virtual currencies were quickly adopted for use as speculative investments and sometimes, due to the pseudo-anonymity they offer, for the transfer of value in relation to criminal or illicit activities. Today, these assets are becoming progressively mainstream and their growth has been exponential even though their value continues to fluctuate significantly.

The emergence of crypto-assets has been enabled by DLT, such as blockchain, upon which crypto-assets are based. The World Bank Group defines DLT as "a novel and fast-evolving approach to recording and sharing data across multiple data stores (ledgers), which each have the exact same data records and are collectively maintained and controlled by a distributed network of computer servers, which are called nodes" (World Bank, 2019[9]) The technology allows for transactions and data to be recorded and shared in a synchronised and decentralised way across network participants. The key advantage is that transactions between network participants do not necessarily need an intermediary or central party to be processed (Houben and Snyers, 2018[10]).

Blockchain is a specific kind of DLT, which underpins many different applications, including many of the virtual currencies, such as Bitcoin. "A 'blockchain' is a particular type of data structure used in some distributed ledgers which stores and transmits data in packages called 'blocks' that are connected to each other in a digital 'chain'. Blockchains employ cryptographic and algorithmic methods to record and synchronize data across a network in an immutable manner" (Houben and Snyers, 2018[10])

DLTs can rely on different consensus mechanisms to validate any new operation or transaction occurring on the network. The most commonly-used consensus mechanisms are the following:[7]

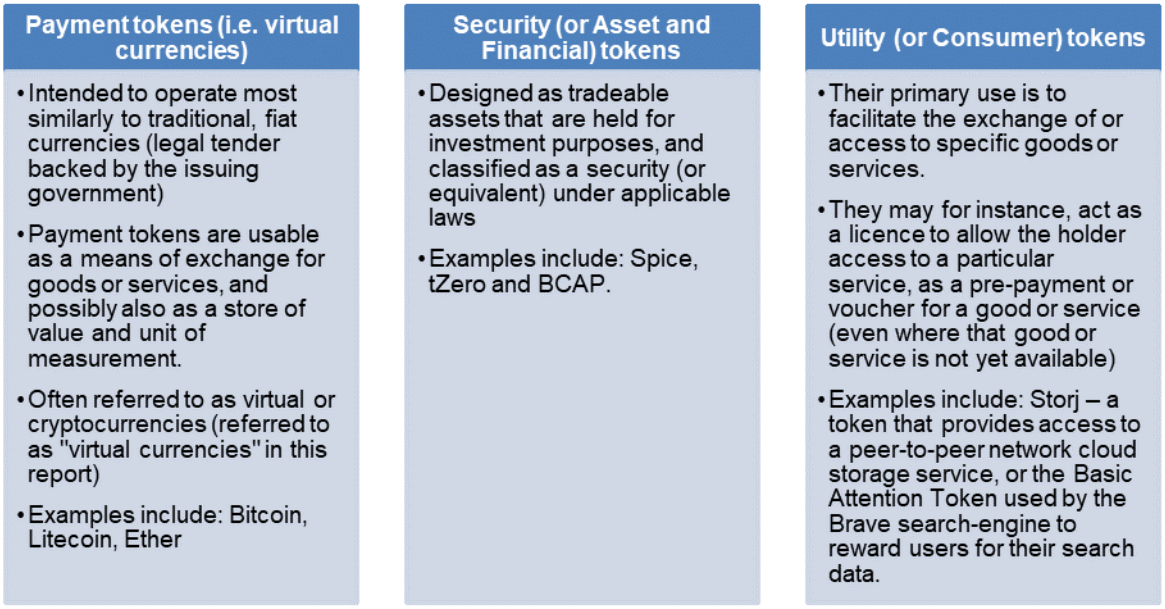
- **A proof of work system** is based on mathematical equations, typically hard to solve but whose solutions can be easily checked. Solving the mathematical problem involves computational efforts – resulting in high energy consumption, whereby each validator (called a 'miner') makes calculations to verify the transaction and share their results with the network, working on a competitive basis since a reward is credited to the miner who finds the solution first. Proof of work is for instance used with the Bitcoin blockchain, and currently most DLTs.
- **A proof of stake system** assigns shares of validation rights to users according to the stake they have in the blockchain. In such a system, validators are not called miners – but 'forgers' or 'stakers'. Stakes can be measured differently (amount of tokens owned, holding period, amount of assets locked in the blockchain as collateral). Forgers or stakers must have a minimum stake in the blockchain to be able to participate in the verification process: they 'stake' their own tokens to have the right to verify a transaction, and are credited a transaction fee or new tokens. No mathematical equations are therefore required to verify a transaction. This makes the verification process considerably more energy efficient than a proof of work mechanism. Proof of stake is for instance used with the Peercoin blockchain.
- **Other consensus mechanisms** exist but are less common, including 'delegated proof of stake' – whereby token holders can vote to designate who they wish to be a block validator – and 'proof of authority' – whereby validators do not stake their tokens, but rather their reputation: if they prove to be unreliable, they are not allowed to validate blocks any longer (Medium, 2019[11]).

Given the fact that there is no internationally agreed standard definition of crypto-assets, there is also no standard taxonomy of the different types of assets that comprise crypto-assets. Nevertheless, based on their economic function, regulators and researchers broadly classify crypto-assets into three main categories: as payment tokens, utility tokens, or security tokens (Global Digital Finance, 2019[12]; European Banking Authority, 2019[5]). Common definitions of these types of crypto-assets are set out in Figure 1.2..

[7] For a detailed technical explication of the functioning of proof of work and proof of stake consensus processes, see (European Central Bank, 2016[146])

These categories exist on an overlapping spectrum (hybridity). Further, in some cases, a token's character may mutate over the course of its lifetime (mutability). As with the underlying questionnaire, the focus of this paper is on payment tokens, commonly known as virtual currencies. Within this grouping, there are a variety of types of tokens, including 'traditional' virtual currencies such as Bitcoin, as well as new and emerging forms in the shape of stablecoins and central bank digital currencies (CBDCs). Virtual currencies are the type of token that is most commonly the subject of country guidance at the time of writing. By contrast, less information is available on utility and security tokens.

Figure 1.2. Common categories and types of crypto-assets



Source: OECD

While such a three-tiered classification system is a good first step in supporting the formulation of regulatory responses to crypto-assets, its broad nature raises several issues. For example, these categories may be interpreted differently across jurisdictions, which may result in a different classification of assets and different tax implications. In addition, some crypto-assets cannot be classified under any of these categories. In contrast, there are also several types of crypto-assets that can be classified under multiple categories, requiring a clear and specific statement on their regulatory treatment (Cambridge Centre for Alternative Finance, 2019[3]).

Additionally, a distinction could be made between those crypto-assets that resemble 'conventional' assets, like securities, and which are merely recorded on DLT systems, and those assets and activities that raise new regulatory challenges such as virtual currencies, depending on the regulatory approach that jurisdictions adopt. Existing securities and banking or payment laws might be appropriate for the former, while consideration could be given to whether the existing frameworks can be applied to other forms of crypto-assets, including virtual currencies. This paper focuses predominantly on the tax policy issues relating to 'traditional' virtual currencies, although the conclusions may in some cases also be applicable to other crypto-assets that raise new regulatory challenges. In addition, Part III considers the tax implications of stablecoins and CBDCs in more detail.

1.2.2. Key taxable events related to virtual currencies

While each virtual currency is unique, the below description is intended to describe the typical "lifecycle" of a unit of virtual currency, emphasising the key stages in which tax consequences may arise.

Creation

When a new virtual currency is created, one of the first steps is to ensure that it is available in the hands of potential users. This can occur in a number of ways, including through airdrops, an initial token offering, mining and/or forging:

- **Airdrops:** an airdrop is the distribution of tokens without compensation (i.e. for free), generally undertaken with a view to increasing awareness of a new token, particularly amongst "influencers", and to increase liquidity in the early stages of a new token project.
- **Initial Token Offering (ITO):** also known as an Initial Coin Offering (ICO), an ITO involves the issuance of a new token, which is often issued in exchange for one of the major virtual currencies e.g. Bitcoin, or in some cases, fiat currency. The majority of ITOs to-date have involved the issuance of utility tokens, rather than security tokens or virtual currencies. While initially common, ITOs have been considerably less frequent in 2019 and 2020 than in earlier years, in part due to the efforts of the United States' Securities and Exchange Commission and other national agencies in regulating ITOs. The declining use of ITOs also reflects the evolution of the market with fewer players in a position to compete with well-established virtual currencies such as Bitcoin and Ether (Nasdaq, 2020[13]).
- **Mining:** refers to the process in some distributed-ledger protocols by which transactions of virtual currencies are verified and are added to the blockchain-based ledger (record of transactions). The "miner" (the person on the network undertaking the necessary computer processes by being the first to solve complex equations, typically under a 'proof of work' protocol) may be entitled to (i) a **mining reward**, paid through new tokens, and/or (ii) a **protocol transaction fee**, which is a percentage of the value of the transaction being processed and is paid from that transaction.[8] For the existing blockchains, in particular for virtual currencies, creating and releasing new blocks to a chain is mainly achieved through mining as the most popular blockchains are based on a 'proof of work' mechanism (e.g. Bitcoin, Ethereum – for now, and Dash). To maintain a limited and finite supply (possibly for other reasons), virtual currencies are designed with a fixed upper limit on how many tokens can be mined. For example, Bitcoin's maximum supply has been capped at 21 million tokens since its inception in 2009 – currently, there are over 18 million in existence as of July 2020.[9]
- **Forging:** this is often termed more commonly as staking and refers to the process through which transactions are verified when a DLT uses a 'proof of stake' mechanism, as described above.

Storage and transfer

In order to hold a token, users require a wallet. Each wallet consists of one, or multiple, digital wallet addresses. At this stage, the main types of digital wallets for holding crypto-assets can be grouped into four categories:

- Hot custodial wallet: a wallet that is connected in some way to the internet (i.e. "hot") and which is managed by a third party (e.g. TrustVault), whereby the third-party holds the user's private keys – these are a form of cryptography that allows the user to access the wallet, which is an element of security.

[8] This protocol transaction fee should be distinguished from **3rd party transaction fees ("3P transaction fees")**, which may be charged by third-party intermediaries such as online crypto-exchanges such as Coinbase or Kraken.
[9] https://courscryptomonnaies.com/bitcoin

- Hot non-custodial wallet: also connected to the internet, the user downloads a software application to create the wallet on their own computer, whereby the user retains control of their private keys. Examples include Copay and Electrum.
- Cold hardware wallet: a physical device (similar to a USB/flash drive) that is kept offline (i.e. "cold") but which can be connected to an online computer when needed (e.g. Trezor and Ledger Nano S).
- Cold paper wallet: pieces of paper on which the digital address and private key are recorded. They can be generated by downloading a piece of software, which is then run on an offline computer and printed, before deleting the wallet before the computer is re-connected to the internet. (e.g. Paper Wallet and Walletgenerator.net).

The wallets use asymmetric cryptography based on a key-pair made up of a public and private key, to maintain the security of any token transactions. The digital wallet address is a cryptographically encoded version of the public key. The accompanying private key is kept confidential to the user.

When executing a transaction, the sender "signs" the transaction using their private key. Using the public key, the receiver, as well as all the other users on the network, can verify the private key to confirm that the right sender indeed approved the transaction and has the funds available to make the transaction. Transactions are validated and then compiled into a block with other transactions, time-stamped and "confirmed", adding the blocks in chronological order to the blockchain ledger.

Exchange

In order to find potential token purchasers or sellers, a user may use a virtual currency exchange or an over the counter (OTC) broker through a peer-to-peer network a third-party intermediary. These services may facilitate the exchange of one unit of virtual currency for goods and services, for another type of virtual currency, for another type of crypto-asset, or for fiat currency.

- Virtual currency Exchanges: an (online) service allowing customers to trade virtual currencies for other assets, either fiat currency or other crypto-assets. At this stage, these services are predominantly still custodial (e.g. Coinbase, Kraken), although some non-custodial exchanges (essentially online "peer-to-peer" thus limiting or removing the role of a centralised intermediary) exist, although levels of adoption are low.
- Over the Counter (OTC) broker: this refers to a process of brokering an "off-market" exchange of tokens in exchange for either fiat currency or for other crypto-assets. Such transfers may either be offline "peer to peer" exchanges, or be brokered by a third-party intermediary. They are often used for the transfer of a large value of tokens to secure a specific market price by avoiding price slippage while the transaction takes place. The use of OTC brokers is becoming more common and it is generally accepted that volumes of transactions are higher via OTC brokers than via exchanges (Capco, 2019[14]).

Although not yet regulated in a number of countries, exchange platforms and brokers – also known as Virtual Asset Service Providers (VASPs) – are regulated in the EU as a result of the 2018 EU fifth Anti-Money Laundering Directive. The Directive introduced changes to require Know-Your-Customer (KYC) due diligence and to limit the anonymity related to virtual currencies and wallet providers, and now applies to entities providing services of holding, storing and transferring virtual currencies (European Commission, 2020[15]).

Evolution of a token

As the rules relating to the functioning of each type of virtual currency are established by the underlying protocol that is shared by all of the users of that token, most changes to how the token functions requires a change to that protocol. These might be for example changes that would improve the speed at which

transactions can be processed by changing how much information can be included in each block on the chain.

These changes are known as forks in the chain and require users to update the protocol software they are running. In order to implement a fork, a majority of users running the protocol must agree to the change. There are two main types of fork:

- **A hard fork** (sometimes also referred to as a "chain split") changes the protocol code to create a new version of the blockchain alongside the old version, thus creating a new token which operates under the rules of the amended protocol while the original token continues to operate under the existing protocol. One example of this was the July 2017 hard fork of Bitcoin that saw the creation of the Bitcoin Cash token alongside Bitcoin).
- **A soft fork** also updates the protocol, however, it is intended to be adopted by all users on the network and thus no new coin is expected to be created (e.g. the August 2017 Segwit fork to the Bitcoin protocol).

1.2.3. Characterisation as property

The characterisation of crypto-assets is of foundational importance for understanding how they fit within existing tax systems. In the majority of cases, countries consider crypto-assets to be a form of property for tax purposes. Within this definition, countries are adopting different approaches on how to categorise virtual currencies: while the majority of countries analysed refer to them as intangible assets, some consider them as commodities or financial instruments. A minority of countries take a different approach and consider virtual currencies as foreign fiat currencies (e.g., Italy), or as "digital representation of value" (e.g., Poland (Poland's Journal of Laws 2018, item 2193, 2018[16])).

Accounting classification of crypto-assets

There is currently no formal guidance available that indicates how crypto-assets should be classified for accounting purposes. Therefore, it is necessary to apply the existing general accounting principles, which require that assets are classified based on their economic properties. In order to correctly classify crypto-assets, their economic purpose, the rights and liabilities associated with the assets, and the way the assets derive their inherent value are all relevant. As described in Section 1.2.5, crypto-assets can be broadly categorised as 'virtual currencies', 'security tokens' or 'utility tokens', based on the above mentioned criteria.

Different types of tokens will require a different type of classification for accounting purposes and tax purposes. For example, a security token, which provides the owner with a contractual right to cash or another financial asset, could be considered as a financial asset subject to International Financial Reporting Standards (IFRS) 9 (PWC, 2019[17]); while utility tokens, which represent a right to receive future goods or services, can be considered as a prepayment for those goods and services, and could therefore be treated as such under IFRS 15 (KPMG, 2019[18]).

Virtual currencies and intangible assets

Virtual currencies on the other hand are generally considered to be intangible assets. While virtual currencies might not fit perfectly into existing asset classes, a number of major accountancy firms propose to classify these assets as 'intangible assets other than goodwill', instead of creating a new asset class (Sean Stein Smith and John Castonguay, 2019[19]). This approach corresponds to the one adopted by most tax administrations, which have so far not created specific and ring-fenced tax regimes to tax the creation, mining, exchange and storage of virtual currencies.

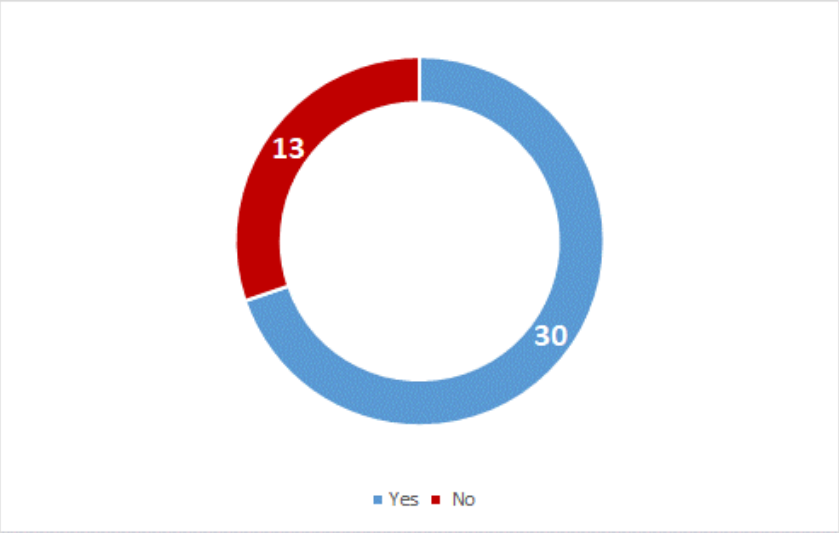
Similarly, the International Financial Reporting Interpretations Committee (IFRIC) notes that virtual currencies meet the definition of an intangible asset under IFRS IAS 38, which defines an intangible asset as "an identifiable non-monetary asset without physical substance". Indeed, according to IFRIC, a virtual currency fits the definition of an intangible asset as "(a) it is capable of being separated from the holder and sold or transferred individually; and (b) it does not give the holder a right to receive a fixed or determinable number of units of currency." (International Financial Reporting Interpretations Committee, 2019[20])

Moreover, IFRIC notes that virtual currencies should not be classified as financial assets or cash. Virtual currencies cannot be considered as financial assets as these assets are neither equity nor do they give rise to contractual rights for its holder to receive cash or to exchange financial assets or financial liabilities with another entity.

Similarly, IFRIC argues that while some virtual currencies can be used in exchange for goods and services, they cannot be classified as cash, because no virtual currency "is used as a medium of exchange and as the monetary unit in pricing goods or services to such an extent that it would be the basis on which all transactions are measured and recognised in financial statements.".

While in most cases virtual currencies are thus classified as intangible assets, IFRIC notes that these assets should be accounted for as inventory in accordance with IFRS IAS 2 when an entity holds these assets for sale in the 'ordinary course of business'. This would apply in particular for brokers and traders of virtual currencies.

Figure 1.3. Do you have guidance available in your jurisdiction on the classification of crypto-assets?



Note: Yes = Argentina, Australia, Austria, Canada, Chile, Colombia, Croatia, Estonia, Finland, France, Germany, Hong Kong (China) Hungary, Indonesia, Ireland, Israel, Japan, Latvia, Lithuania, Luxembourg, Netherlands, New Zealand, Portugal, Singapore, the Slovak Republic, Slovenia, South Africa, Switzerland, United Kingdom, United States.
No = Bulgaria, Costa Rica, Czech Republic, Denmark, Grenada, Italy, Korea, Mexico, Norway, Peru, Saint Lucia, Spain, Sweden.
Source: Questionnaire responses and country guidance

These considerations provide some direction on how crypto-assets are classified for accounting purposes. Nevertheless, no internationally agreed guidance has yet been issued and several areas require further exploration, especially with regard to 'hybrid tokens', meaning tokens combining features of payment,

security and utility tokens.[10] In addition, many countries are yet to issue guidance on how crypto-assets are classified within their jurisdictions, as seen in Figure 1.3.

1.2.4. Legality of virtual currencies

As the use of virtual currencies is expanding globally, there is an increasing need for countries to define and set the appropriate legal framework for these tokens. The legal status of virtual currencies varies significantly among countries. It is sometimes undefined or evolving, which can make characterisation and regulation difficult and in turn, can result in different or uncertain tax treatments.

The vast majority of countries broadly consider crypto-assets and in particular virtual currencies to be 'legal', in so far as they do not prohibit the purchase and sale of crypto-assets, and their use for the purchase of goods and services. Most OECD and G20 countries[11] have issued laws or guidance, which implicitly or explicitly recognise that the use of crypto-assets is legal.[12] Guidance acknowledging the legality of virtual currencies include dedicated laws or regulation defining them and the regulatory requirements they are subject to, for example, Japan's Payment Services Act (Japanese Ministry of Justice, 2017[21]) (Cambridge Centre for Alternative Finance, 2019[3]), Mexico's FinTech Law as amended in 2018 (Goitom et al., 2018[22]) or the United Kingdom's 2019 Financial Conduct Authority guidance (UK Financial Conduct Authority, 2019[23]). Other guidance includes registration requirements to the financial regulator for companies willing to deal in virtual currencies, de facto recognising that their use is permitted (e.g. Canada, United States). However, these jurisdictions often emphasise that virtual currencies are not legal tender (see section 1.2.5).

In contrast, several jurisdictions have imposed full or partial bans on virtual currencies. These bans frequently prohibit specific activities that are part of a token's lifecycle. At times these bans leave considerable room for interpretation and do not provide details as to what activities are prohibited. In many jurisdictions the legal status of crypto-assets remains controversial. Nevertheless, regulators seem to specifically focus on virtual currencies and in particular on Bitcoin.

Bans on virtual currencies and other restrictions can generally be classified into the following categories:

- General ban: Several jurisdictions have banned the use of virtual currencies and/or any transaction involving virtual currencies. These bans prohibit the purchase and sale of virtual currencies, and commonly prohibit its use as means of payment. Jurisdictions with such bans include: Bangladesh (The Law Library of Congress, 2018[24]), Bolivia (Banco Central de Bolivia, 2017[25]), Iraq (The Law Library of Congress, 2018[24]), Morocco (Morocco World News, 2017[26]), Nepal, North Macedonia (The Law Library of Congress, 2018[24]), Lesotho (Central Bank of Lesotho, 2018[27]), Russia (Forbes, 2020[28]) and Saudi Arabia (Saudi Arabian Monetary Authority, 2018[29]). Some jurisdictions, including Algeria (Journal Official de la République Algérienne, 2017[30]), explicitly note that the possession of virtual currencies is illegal.
- Ban on commercial trading platforms: Some jurisdictions do not prohibit transactions involving virtual currencies as such, but instead prohibit the operation of (commercial) trading platforms.

[10] An example of a hybrid token (combining investment and utility features) is Crypterium, used to pay transaction fees when using the services provided by the issuer (notably banking solutions). This hybrid token gives both a right to discounts for future services and a right to revenues.

[11] Notable exceptions are Russia and Saudi Arabia, where virtual currencies face a general ban. Several restrictions on the exchange or use of crypto-assets apply in China and Indonesia. In the latter, crypto-assets can only be traded if they have been specifically authorised by the Indonesian Commodity Futures Trading Regulatory Agency – CoFTRA (Indonesian Commodity Futures Trading Regulatory Agency, 2020[148]).

12 Most recently, the EU Commission proposed on 24 September 2020 a new digital finance package including a digital finance strategy and legislative proposals on crypto-assets and digital resilience, "to draw on the possibilities offered by crypto-assets, while mitigating risks for investors and financial stability".

These bans could apply only to local trading platforms or apply to all trading platforms. Jurisdictions with such bans include China (BeInCrypto, 2019[31]).

- Ban on using virtual currencies as means of payment: Some jurisdictions have prohibited the purchase of goods and services with virtual currencies. Jurisdictions with such bans include: Ecuador (Banco Central del Ecuador, 2018[32]) and Indonesia (Bank Sentral Republik Indonesia, 2018[33]).
- Ban on Initial Coin Offerings: Some jurisdictions have prohibited Initial Coin Offerings. Jurisdictions imposing such bans include: China (BeInCrypto, 2019[31]) and Korea (Reuters, 2017[34]).
- Restriction on the financial sector: Some jurisdictions have prohibited regulated financial institutions from engaging in related activities and directly or indirectly facilitating individuals and businesses with undertaking such activities. Jurisdictions with such restrictions include: Cambodia (The Phnom Penh Post, 2018[35]), China (BeInCrypto, 2019[31]), Colombia (Superintendencia Financiera de Colombia, 2017[36]), the Dominican Republic (Banco Central de la Republica Dominicana, 2017[37]), Iran (Financial Tribune, 2018[38]), Jordan (The Jordan Times, 2014[39]), Kuwait (The Law Library of Congress, 2018[24]), Lithuania (Bank of Lithuania, 2017[40]), Macau (Monetary Authority of Macao, 2017[41]), Qatar (Securities, 2020[42]), and Thailand (The Law Library of Congress, 2018[24]).

A number of jurisdictions that had previously banned or severely restricted the use of virtual currencies, have since eased regulations and are moving towards allowing the use of virtual currencies. These include Bahrain, Egypt, India, Pakistan and Vietnam. A notable example is Egypt, where virtual currencies were initially banned by the Grand Mufti under Islamic law, citing concerns about money laundering and tax evasion. In 2019, however, the Egyptian Central Bank took steps to allow businesses to trade virtual currencies when they obtain a license from the Central Bank (Daily News Egypt, 2019[43]).

Another debate is taking place is India on this issue, where the Reserve Bank of India had previously put in place measures that effectively outlawed the use of virtual currencies. The Indian Supreme Court ruled against these measures in March 2020, noting that in the absence of any legislative prescription, trading should be considered as legitimate trade. However, draft legislation on virtual currencies is currently pending with the Government of India for final decision (Press Information Bureau of the Government of India, 2020[44]).

1.2.5. Virtual currencies and fiat currencies

Defining currency and money

To determine an appropriate regulation and tax treatment for virtual currencies, it is important to understand not only how to characterise them (see Section 1.2.3), but also what function they perform. One of the arguments for virtual currencies is to offer a decentralised solution for quick cross-border transactions, and they can indeed be used as a means of payment. However, it is not obvious that their features strictly correspond to the legal and economic definition of a fiat currency and to the concept of money. This section analyses both of these issues.

In considering the primary elements of a currency, the following factors need to be considered:

1. a currency is a representation of value (associated with the monetary concept of “unit of account”),
2. a currency is issued by a public authority such as a central bank (which translates into a claim on the issuer), and

3. a currency is recognised as legal tender (meaning mandatory acceptance, acceptance at full face value, and has the power to discharge debtors from their payment obligations) in at least one jurisdiction.[13]

There are also "political economy" elements that define a currency that are linked to sovereignty and to trust. The public authority's exclusive monopoly over the issuance of banknotes and coins is a form of expression of a country's sovereignty. The IMF also notes that "the legal concept of money is also based on the power of the state to regulate the monetary system" (Dong He et al., 2016[45]). In addition, the element of public trust lies in the fact that a currency reflects a common and broad recognition, within a country or a monetary area, of the value it represents. Anecdotally, this trust aspect corresponds to an alternative meaning of the word "currency" in English – that it represents an intrinsic value, even if most countries' currencies are no longer linked to another value or commodity such as gold (Cambridge University Press, 2020[46]). The credibility and the value of a sovereign currency are therefore intrinsically linked with the ability of a country to support that currency.

The concept of currency is linked to the concept of money. As defined by the ECB, money corresponds to anything that is widely used to exchange value in transactions (European Central Bank, 2015[47]). In economic theory (William S. Jevons, 1875[48]), money performs three different functions: (1) a unit of account, (2) a means of exchange and (3) a store of value, which may better correspond to the concept of virtual currencies. See Table 1.1. for a comparison with the features of virtual currencies. Over time money has changed from commodity-based (e.g. linked to gold as a standard) to fiat currency (European Central Bank, 2012[49]).

Are 'virtual currencies' actual currency?

It seems clear from the literature described in this section, and from a brief analysis of the elements defining a currency, that virtual currencies do not constitute something similar to a generally accepted currency.

Considering the primary elements characterising a currency, whether the requirement of the representation of value is met by virtual currencies (denoted in this section as virtual currencies for consistency with the rest of the report) is debatable. On the one hand, virtual currencies are considered "digital representation of value" by some countries and regulators. For example, the EBA refers to the fact that value is represented in digital form and is close to the concept of a unit of account (see above), while noting that a private money or a commodity can also be a representation of value (European Banking Authority, 2014[50]). On the other hand, virtual currencies have no intrinsic value as they are not linked to any underlying commodity or sovereign currency, except in the case of some stablecoins and Central Bank Digital Currencies.

The issuance requirement clearly differentiates 'virtual currencies' (i.e. virtual currencies) from fiat currencies. Virtual currencies are akin to a form of private money (Marek Dabrowski and Lukasz Janikowski, 2018[51]), as they are not issued by a public authority and are largely unregulated.

The requirement of being legal tender in at least one jurisdiction also establishes a clear divide between virtual currencies and the economic definition of currency. Virtual currencies do not meet any of the features that characterise a legal tender: when tendered to a creditor, they are not widely recognised as a valid and legal offer of payment, although acceptance for some online transactions is increasing.

Considering the economic definition of money, even if virtual currencies could share one or more of its functions, these are "not comparable in terms of quality, and are not always fulfilled at the same time as each other or to the same extent" according to the EBA. Virtual currencies do not seem to fulfil all three of the economic roles associated with money, as indicated in Table 1.1 below.

[13] For a comprehensive definition of legal tender, see (European Commission, 2010[144]).

Table 1.1. Economic roles associated with money and their application to virtual currencies

Roles	Units of account	Means of exchange	Store of value
Economic definition	Reflects a standard numerical unit that can be used for measuring the value and costs of goods, services and assets and liabilities	Reflects a high liquidity, a wide acceptance and exchangeability, a recognition as a way to make a transaction.	Represents a purchasing power that can be saved, exchanged or retrieved in the future.
Application to virtual currencies	There is little evidence that virtual currencies are used as independent units of account as they mostly represent an equivalent value in fiat currency	The limited, although growing, acceptance of virtual currencies restricts significantly their use as means of exchange – a limited number of merchants accept them	The ability of virtual currencies to serve as a reliable store of value is significantly limited by their high volatility of their purchasing power.

Almost all countries appear to take the view that virtual currencies are not equivalent to sovereign currencies. In the public guidance issued by their financial regulators or tax authorities, governments often define virtual currencies by enumerating what they are not, and state explicitly that they do not constitute a fiat currency. This is the case for the following countries, which represent the majority of those analysed in the present report: Argentina, Australia, Austria, Canada, Chile, Estonia, Finland, France, Germany, Hungary, Ireland, Israel, Latvia, Mexico, the Netherlands, Nigeria, Portugal, Singapore, the Slovak Republic, Slovenia, South Africa, Spain, the United Kingdom, and the United States.

In other countries however, the absence of a definition in legislation or in guidance creates uncertainty about the actual legal status of virtual currencies. The lack of a clear position in regards to fiat currency can indicate either that there is not yet any consensus or that work is in progress – indicating that the tax treatment is not yet stabilised. (e.g. India or in Portugal to some extent) or that governments have deliberately opted not to regulate, sometimes leaving the income generated by virtual currencies as effectively exempt (e.g. Saudi Arabia).

2 Key tax policy considerations & overview of country treatments

2.1. Approach to analysis

This section provides an overview of the tax treatment of virtual currencies in a number of countries around the world. It seeks to provide a framework to analyse the tax treatment of different events in the lifecycle of a unit of virtual currency– focusing on its creation and the various forms of exchange or disposal. It then outlines some of the emerging developments in the virtual currency space that can challenge the current tax treatments.

The analysis of income tax, value added tax (VAT)[14] and property tax rules that is presented in this section is based primarily on the responses to a questionnaire sent to countries in late 2018 and again in early 2020. The questions in this questionnaire covered guidance provided by countries in relation to the definitions of virtual currencies for tax purposes, and key taxable events under income taxes and VAT. Responses were received from over 50 countries.[15] This information has been supplemented with a wide range of publicly available guidance and other public material for these countries, as well as other OECD and G20 countries.

The questionnaire responses have formed the basis of the analysis, however, for a number of reasons it is not possible to provide a comprehensive overview of each country's tax treatment of virtual currencies based on the information available. First, in many countries guidance has not yet been provided or is only partial in its coverage of the key issues considered in this report (see Figure 2.1).

Many respondent countries have indicated that certain elements of the tax treatment of virtual currencies have not yet been fully considered in their jurisdiction. Second, while normal tax rules are likely to apply to virtual currencies (e.g. if they are considered to be a property asset, they will likely be treated in the same way as other property assets) in the absence of detailed guidance, or a clear definition of virtual currencies for tax purposes in a particular country, it is sometimes difficult to define their precise treatment. Third, as this represents a new and emerging area of policy interest, in many countries the development of policy

[14] The acronym "VAT" refers to any national value-added tax (VAT) and its equivalent in several jurisdictions (goods and services tax, or GST).

15 Responses were received from Andorra, Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Cote d'Ivoire, Canada, Chile, Colombia, Costa Rica, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Grenada, Hong Kong (China), India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Malaysia, Malta, Mexico, the Netherlands, New Zealand, Norway, Peru, Poland, Portugal, Saint Lucia, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. These countries are collectively referred to in this report as the "respondent countries".

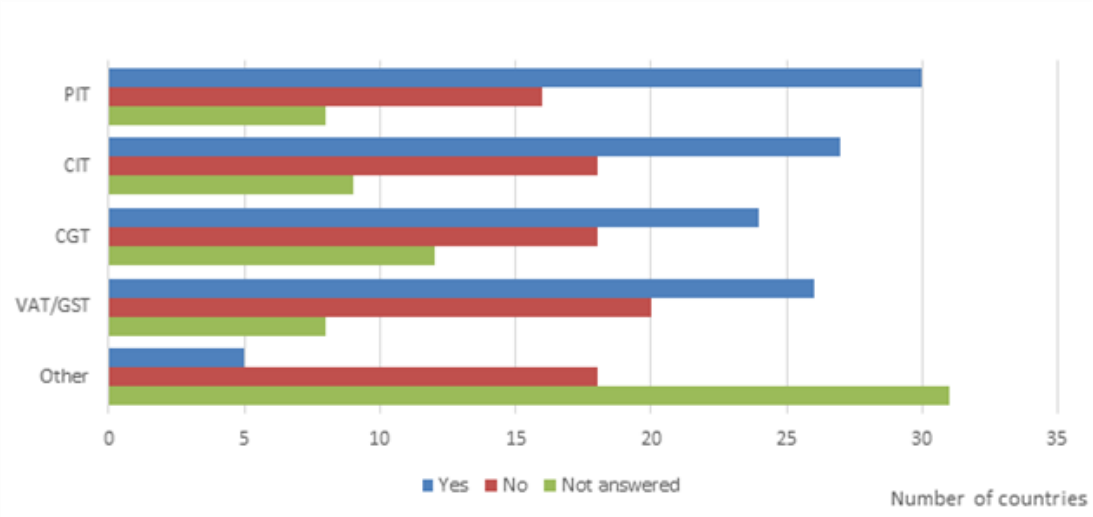
on the taxation of virtual currencies is work in progress. In this sense, the report provides a first glimpse of the taxation treatment of virtual currencies, in what is a rapidly evolving policy area.[16]

In the absence of comprehensive information for each country, the report proposes a framework for the tax treatment of different events in the lifecycle of virtual currencies and seeks to situate as many countries as possible within this framework, drawing on the information available, to draw conclusions about the most common treatments, notable exceptions or differences, and areas in which guidance is lacking.

2.2. Income taxation: overview of treatments and taxable events

The income tax treatment of virtual currencies across countries often flows from the definition of virtual currencies within a country, as this defines how they fit within existing tax laws on the taxation of income from different sources. Most commonly, virtual currencies are considered to fall within an existing category of income and taxed in the usual way for that form of income. Many countries have also published guidance documents to clarify how virtual currencies are treated for tax purposes and how the existing tax policy framework applies to these assets, as shown in Figure 2.1. The various approaches to the income taxation of virtual currencies across respondent countries that have issued guidance are outlined in this section.

Figure 2.1. Does your jurisdiction provide guidance on the tax treatment of virtual currencies?



Source: Questionnaire responses.

As discussed, very few countries consider virtual currencies (which may also be described as cryptocurrencies, payment tokens or by other names in country guidance) to be a type of currency (foreign or domestic) for tax purposes. Reasons for this vary, but often relate to their decentralisation, lack of backing, price volatility and limited use as a means of exchange. Similarly, for income tax purposes, almost all countries that have issued a statement on the matter have declared these to be a form of property for tax purposes, as set out in Table 2.1.

[16] The report covers tax treatments applied at the national (i.e. central or federal government) level. In many countries, sub-national taxes, including taxes on income, indirect taxes such as sales taxes, and property taxes, may also apply. In these cases, clear guidelines for taxpayers on the appropriate classification of virtual currencies for tax purposes at the sub-national level, as well as on the interaction of state and federal tax rules, may simplify compliance.

Table 2.1. Examples of definitions of virtual currencies for tax purposes

Intangible assets other than good will	Financial instrument or asset	Commodity or virtual commodity	Currency	Legal payment method	Not specified
Australia, France, Chile, Czech Republic, Luxembourg, Nigeria, Spain, Sweden Switzerland** and the United Kingdom	Argentina,* Brazil, Croatia, Denmark, Israel, Japan, Slovak Republic and South Africa	Austria, Canada, China and Indonesia	Belgium, Cote d'Ivoire, Italy and Poland	Japan	United States

Source: Questionnaire responses and country guidance documents.
* Note from Argentina: There is no clear definition. However, for income tax purposes, virtual currencies are mentioned along with some financial instruments or assets.
** Note from Switzerland: With the exception of companies that trade in virtual currencies. Those companies account for virtual currencies under inventories.

Only a few of the respondent countries consider virtual currencies to be similar to currency for tax purposes: this is the case in Belgium, Cote d'Ivoire, Italy and Poland. For instance, in Italy, the Italian tax authority has indicated in private rulings that virtual currencies are akin to foreign currency, taking the decision by the European Court of Justice (ECJ) in relation to Hedqvist (detailed below) further than VAT to also cover income taxation (Agenzia Entrate, Italian Ministry of Economy and Finance, 2016[52]) (The Block, n.d.[53]).

In some countries, there is a degree of uncertainty over how virtual currencies are defined which may result in different interpretations of the tax treatment. As virtual currencies are generally considered to be a form of intangible property or financial assets rather than a currency for income tax purposes, normal property tax rules, rather than foreign exchange tax rules are likely to apply. Foreign exchange tax rules typically contain provisions to minimise the tax consequences of foreign exchange taxation for individuals or occasional/minor traders, i.e. by allowing de minimis exemptions or exempting transactions made from individuals' accounts. By contrast, income from property transactions is taxable, either under capital gains taxes, or as business or other income, without, or with only minimal, exemptions for individuals or occasional traders. (Cassidy et al., 2020[54]).

This section considers the tax treatment of virtual currencies at two main events: the creation of a token (most commonly, through mining) and the disposal of tokens. Other events in the lifecycle of a token, notably storage, do not commonly give rise to a taxable event and are not discussed in this section.

2.2.1. Creation of virtual currencies: taxable events

The first possible taxable event related to a unit of virtual currency arises when it is created. Virtual currencies may be created in the process of mining (via rewards under a proof of work protocol), or initial airdrops or ICOs of new tokens. Among these methods of creation, the tax situation of mining has received the most attention from policymakers. This section therefore focuses on the taxable events associated with new virtual currencies received via mining, as distinct from transaction fees that may be offered to miners for completing transactions. Virtual currency units received in airdrops may be of little value, in which case they would raise less concern about tax compliance – airdrops may involve the distribution of very small amounts of virtual currencies which, being newly created, have little market value if any (Bitcoin.com, 2018[55]).

The creation of a new unit of virtual currency via mining can conceptually give rise to a taxable event when the unit is received by the miner, however, this is not considered to be the case in many countries. In addition, the disposal of a virtual currency is normally considered to be a taxable event. In cases where the receipt of a new unit of virtual currency is not considered to be a taxable event, this means that the first taxable event will happen on the disposal of a new unit.

Table 2.2 sets out the first taxable event associated with the receipt of a mined unit of virtual currency, based on questionnaire responses. Most commonly, countries consider the receipt of a mined unit of virtual currency to be the first taxable event, although a significant proportion of respondent countries also indicated that no tax is payable until disposal of the asset. Finally, several countries indicated that the first taxable event may differ depending on whether the mining takes place for business (or habitual) rather than personal (or occasional) purposes.

Table 2.2. First taxable event for mined virtual currencies under income taxes

First event on receipt of new tokens from mining	First event on disposal	Different approaches for businesses/regular traders & individuals/occasional traders
Andorra	Croatia	Australia
Argentina*	Czech Republic	Canada
Austria**	Denmark	Germany
Cote d'Ivoire	Estonia	Hong Kong (China)
Colombia	France	Netherlands
Croatia	Latvia	Norway
Estonia	Lithuania	Singapore
Finland	Poland	Sweden
Japan	Slovak Republic	Switzerland
Luxembourg**		
New Zealand		
Slovenia		
South Africa		
United Kingdom		
United States		

* Note from Argentina: Tax treatment will depend on a case-to-case analysis.
** Mining is considered to be a commercial activity and therefore taxed on an ongoing basis.
Source: Delegates' responses to questionnaire; OECD research

The greatest number of respondent countries indicated that the first income tax event takes place on the receipt of newly mined tokens. These countries include Andorra, Argentina, Austria, Cote d'Ivoire, Colombia, Croatia, Estonia, Finland, Japan, Luxembourg, New Zealand, Norway, Slovenia, South Africa, the United Kingdom and the United States. If taxable on receipt, the value of the unit of virtual currency received is included in taxable income (other capital income, or miscellaneous income) when the token is received, and income tax applies at the normal rate within that category of income, either at personal or corporate income tax rates. The costs associated with deriving that income are deductible.

- For example, in Finland, income earned in the form of mining activity (i.e. under a proof of work mechanism) constitutes income other than income from capital and is treated as earnings. The direct costs incurred in accumulating this income can be deducted, including the costs of electricity and equipment used in mining. A tax liability is triggered on receipt of the token or fee. Special rules may be used to approximate income over a longer time period (e.g. a day or a month) based on average exchange rates. However, new virtual currencies generated by forging (i.e. under a proof of stake mechanism) are treated differently for tax purposes: income from forging is considered to be a return on existing assets (i.e. the previously owned virtual currency) and the income is treated as capital income at the time that the holder acquires control of the new token (Veroskatt, Finnish Tax Administration, 2020[56]).
- In Norway, income from mining is generally liable to tax and the taxable income is calculated based on the market value of the cryptocurrency received at the time of "extraction". If the mining is carried out through a business activity, for example in cases where the mining activity in itself constitutes a business, the income is taxable as business income. If the mining activity is carried out on a low

to modest scale from for example a person's home computer, this will normally not constitute a business activity. However, it would still qualify as taxable income from "assets". In both cases, costs in connection with the extraction/mining of cryptocurrency/virtual assets are tax deductible on an ongoing basis (The Norwegian Tax Administration, 2020[57]).

- In the United Kingdom, income from mining is also treated as taxable on receipt, whether received by individuals or in the course of trade. If the mining activity is not carried out in the course of trading, receipt of new virtual currencies results in miscellaneous taxable income for the miner; transaction fees associated with mining are treated in the same way. The income generated is estimated at the value of the unit of virtual currency in pound sterling at the time of receipt. If the mining activity does amount to a trade, the value of the assets at the time of receipt will be included in taxable income as trading profits (HM Revenue & Customs, 2019[58]). Further gains realised when the new token is disposed of are then taxed under capital gains taxes. In the United Kingdom, however, airdrops are not taxable, if not received in exchange for consideration, but rather give rise to a capital gains liability on disposal.
- In the United States, a taxpayer who mines virtual currencies must include the fair market value of the virtual currencies in gross income as at the date of receipt. If the mining constitutes a trade or business, the net earnings from the trade are considered self-employment income when received (Service, 2014[59]).

A significant minority of countries indicated that the first taxable event occurs on disposal – i.e. when the miner first exchanges, or otherwise disposes, of the virtual currency. In this case, the total value of the virtual currency at the date of its disposal is then included in taxable income, in many cases, less the costs incurred to acquire the asset. These deductions typically also include the computing costs of mining (for example in Australia, Austria and Estonia) although the deductibility of these costs is unclear in Poland. When the first taxable event occurs on disposal, most commonly countries treat the income as capital gains income and tax it under normal capital gains rates and rules. The treatment of the income as a capital gain will mean that in many countries, reduced tax rates, or partial exemptions, will apply, relative to the situation when it is included in ordinary or business income, in which case it is more commonly taxed under progressive income tax rates or the applicable business or company tax rates. In addition, many countries apply exemptions from capital gains tax after a certain holding period is met, which can mean that income from mining can be untaxed.[17]

Countries that indicated that the first taxable event happens on disposal include Croatia, the Czech Republic, Denmark, Estonia, France, Latvia, Lithuania, Poland, Singapore (business mining only) and the Slovak Republic.

Finally, the first taxable event on the receipt of a new unit of virtual currency differs in a number of countries based on whether or not the miner is operating habitually or in the course of business rather than occasionally or as individuals. These countries include Australia, Canada, Germany, Hong Kong (China), Luxembourg, the Netherlands, Singapore, Sweden and Switzerland.

- In Australia, the timing of the first taxable event differs depending on whether the mining is carried out as part of a business activity:
  - If so, any virtual currencies generated via mining is treated as trading stock income: changes in the value of trading stock throughout the year are included in income or losses, and the proceeds from the disposal of the stock represent assessable income. Losses made from the business of mining are deductible against the taxpayers other income. At the same time, expenses incurred in respect to the mining activity, including electricity costs, are deductible.

[17] See for example (Harding and Marten, 2018[142]) which provides information on the holding period tests for capital gains on shares and real property in OECD countries.

  - If the mining is not conducted as part of a business, the mined tokens are first taxed under the capital gains tax on disposal. Normal capital gains tax rates and rules apply, although the Australian Taxation Office has indicated that the personal use exemption is unlikely to apply to capital gains made on the disposal of a unit of virtual currency, unless they are used to make online purchases for personal needs, rather than for investment (Australian Taxation Office, 2014[60]). The capital gain on disposal is the money received in respect of the disposal, less the money paid to acquire the virtual currency. In Australia, the tax treatment of new tokens received via forging differs from those received from mining: they are treated as ordinary income when the new tokens are received (Australian Taxation Office, 2020[61]).
- Similarly, in Canada, virtual currencies acquired via mining activities of a commercial nature is considered as business income at the value of the mined asset when the asset is received, and is treated as inventory of the business. However, if the acquisition via mining is considered to be a speculative investment, the first taxable event occurs on the disposal of the asset. In this case, the holders' costs in acquiring the asset are treated as the basis for the resulting capital gains (Canada Revenue Agency, 2019[62]).
- In Hong Kong (China), only Hong Kong sourced profits from virtual currency business activities are subject to profits tax. Such business activities include trading of virtual currency, exchange of virtual currency and mining. Characterisation of the business activity is "a matter of fact and degree to be determined upon a consideration of all the circumstances" (Inland Revenue Department of Hong Kong, China, 2020[63]).

In a few countries, a taxable event relating to mining may only occur if the mining activity amounts to a business, whereas private mining activity is not taxable:

- In Switzerland, individuals' capital gains from mining assets are not taxable, provided that the activity is carried out as private asset management. However, if the mining is seen to be a lucrative business activity, capital gains taxes apply on disposal of the asset, and losses are deductible (Swiss Federal Tax Administration, 2019[64]).
- In Singapore, miners' profits from the receipt of virtual currencies are taxable if the miner performs the activity with the intention of profiting, provided the gains or losses are assessed to be trading in nature. Companies engaging in mining activities are normally regarded as carrying on a business of mining and normal income tax rules apply upon the disposal of the tokens. By contrast, miners that are performing activities as a hobby or as a long-term investment do not need to pay income tax on their gains, as per normal income tax rules. Prima facie, individuals engaging in mining activities are treated as engaging in a hobby. The presumption that an individual is doing so on a hobby basis can be reversed if there is a habitual and systematic effort to make a profit from the activities. Transaction fees from mining transactions are taxable income in all circumstances (Inland Revenue Authority of Singapore, 2020[65]).

2.2.2. Disposal of virtual currencies: taxable events

The disposal of a virtual currency is also likely to give rise to a taxable event. Disposals may occur in exchange for consideration – e.g. through exchanges for fiat currency, another virtual currency or digital asset, or for a good or service – or in a situation without a reciprocal exchange of value, or sans contre partie – e.g. via gift, inheritance, loss or theft. This section gives an overview of the main taxable events and tax treatments for the different forms of disposal, based on country responses to the questionnaire and the available guidance documents.

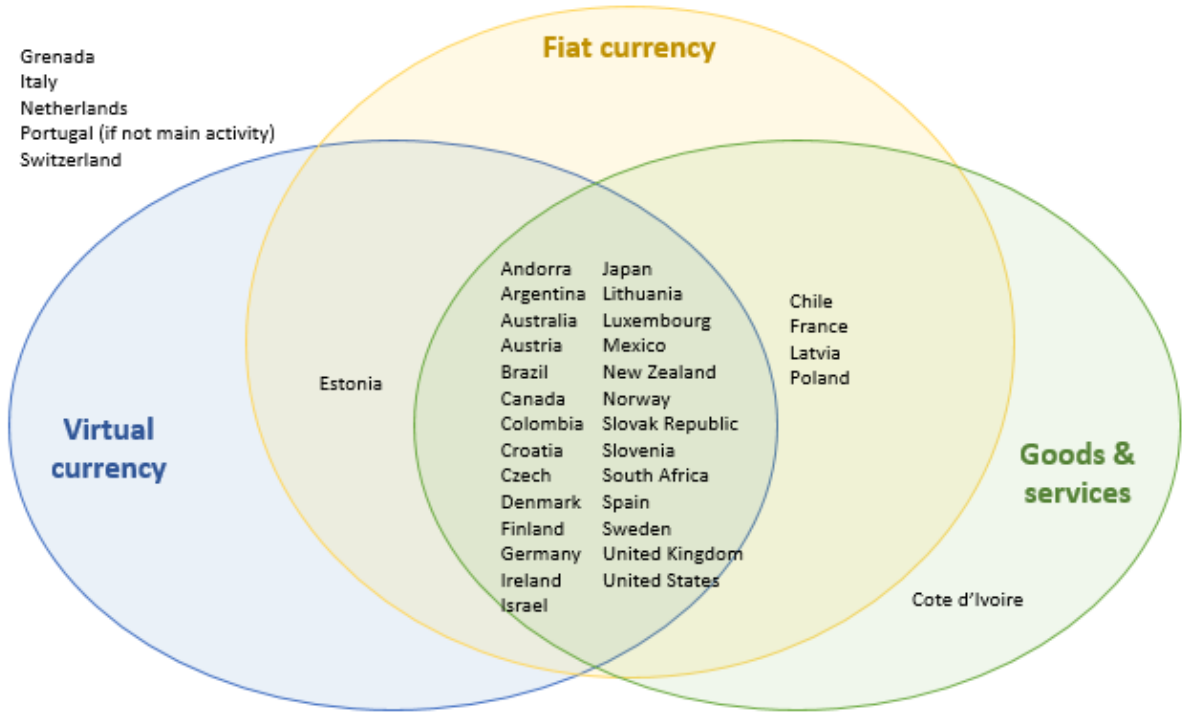
Exchange of a virtual currency for consideration

For the purposes of this section, whether or not an exchange for consideration effects a taxable event is considered against three groups of transactions:

- Exchange of a virtual currency for fiat currency
- Exchange of a virtual currency for other virtual currencies or crypto-assets
- Exchange of a virtual currency in payment for goods and services, or wages

Figure 2.2 provides a conceptual approach to classify country approaches to the taxation of virtual currencies when exchanged against each of these three asset types. It sets out responses received from countries on whether the exchange of a token against one of these three groups constitutes a taxable event.

Figure 2.2. Which exchanges of virtual currencies generate a taxable event?



Source: Questionnaire responses

As shown in Figure 2.2, a small number of countries do not consider any exchanges made by individuals to be a taxable event for the holder of the virtual currency. These countries include Grenada, Italy, the Netherlands, Portugal and Switzerland. For example:

- In Portugal, following a ruling by the Portuguese Tax Authority in 2016, exchanges in virtual currencies are not treated as taxable income in most cases as they do not fall within the definition of capital gains or of capital income for tax purposes (Autoridade Tributária e Aduaneira, 2015[66]). They may, however, be taxable as business or professional income if they constitute a professional or business activity of the taxpayer.
- In Switzerland, the buying and selling of virtual currencies is treated as akin to transactions with conventional means of payment. The profits and losses from these transactions are therefore

without tax consequence: gains are non-taxable and losses are non-deductible. However, if the type and scope of the transactions is sufficient to be considered commercial, the capital gains may be taxable under income taxes and the losses deductible (Swiss Federal Tax Administration, 2019[64]).

- In Italy, transactions of individuals in virtual currencies are not generally taxable, unless they are deemed to be speculative.[18] Proceeds arising from speculative exchanges of virtual currencies are subject to the standard rules for income arising from trades of foreign fiat currencies (i.e. subject to a flat 26% substitutive tax for Italian resident individuals and to the standard corporate income tax for businesses). Tax authorities consider there is speculative activity if, during the fiscal year and for at least seven consecutive days, the threshold of ownership of virtual currencies exceeds circa EUR 51 000. Taxes also may be payable if the profit from trading exceeds EUR 51 646 for seven consecutive days. Similarly, companies subject to corporate income tax must pay taxes on the exchange movements between virtual currencies and fiat currencies (Agenzia Entrate, Italian Ministry of Economy and Finance, 2016[52]).

The tax treatment of virtual currencies owned by individuals in the Netherlands is different compared to many other countries. In the Netherlands, virtual currencies held by an individual tax resident in the Netherlands will be taxed under the presumptive regime for saving and investments (Box 3). Under this regime, taxpayers are deemed to receive a percentage of the positive balance of the fair market value of their assets (including virtual currencies) less the fair market values of the liabilities. No taxation occurs if the positive balance does not exceed a threshold of EUR 30 360. The fair market value of assets and liabilities is measured every year on 1 January. The deemed return against this value is taxed under the regime for savings and investments at a rate of 30%. This regime does not apply to corporations in the Netherlands, which are subject to corporate income tax with respect to any profits or capital gains realised on dealings involving virtual currencies, including mining and trading (Belastingdienst, Netherlands Tax Authority, n.d.[67]).

Among the other respondent countries, almost all consider exchanges between virtual currencies and fiat currency to be a taxable event. With a few exceptions, the same group of countries also consider exchanges between virtual currencies and other forms of virtual currency to generate a taxable event. Countries that do not consider exchanges with other virtual currencies to be taxable include Chile, France, Latvia and Poland. The rationale for excluding these transactions may be either pragmatic in nature, to avoid difficulties in establishing the fiat currency value of a trade happening entirely between two virtual currencies, where the fiat currency value may be hard to assess, or it may be part of a broader strategy to encourage trading in virtual currencies by providing tax consequences only when an exchange happens with fiat currency or a good or service. Among these countries, different approaches exist:

- In France, the General Tax Code, Article 150 VH bis, indicates that exchanges of virtual currencies for a fiat currency, for a good other than a digital asset, for a service, and for another virtual currency when the difference in value is paid in fiat currency, are taxable. Any exchange of a virtual currency for another virtual currency is note considered a taxable event. In the case of such a transaction, the French tax authority's guidance indicates that the fees linked to a transaction and the reward given to miners to validate the operation are also exempt (Ministère de l'Economie et des Finances, 2019[68]).
- In Poland, exchanges of one form of crypto-asset for another are considered to be "tax neutral" regardless of the exchange method (i.e., on the market, in an exchange office or within an individual exchange). By contrast, income from exchanges against fiat currency, or when virtual currencies are used in payment for other goods and services, are treated as capital gains, whether derived from a business or personal activity and are subject to the flat capital gains tax rate.

[18] Questionnaire responses and (Agenzia Entrate, Italian Ministry of Economy and Finance, 2016[52]).

In the case of exchanges for fiat currency or for another virtual currency, most countries do not distinguish between occasional trading and trading as a business for tax purposes. This is the case, for example, in Brazil, Chile, Czech Republic, Denmark, Estonia, Germany, Latvia, Hungary, Korea,[19] Iceland, Mexico, Norway, Poland, and the United States. In Denmark, gains from the disposal of virtual currencies are generally considered speculation and thus taxable under capital gains taxes at either individual or business tax rates (Skattestyrelsen, n.d.[69]).

However, a number of countries do distinguish between exchanges conducted by individuals and those conducted in the course of business (or by businesses). Persons or companies involved in occasional activities for personal purposes are subject to capital gains taxes, meaning that normal capital gains exemptions, reduced rates, or reliefs may apply; although in this case losses are also likely to be ring-fenced against capital income. By contrast, exchanges considered to be conducted in the course of business, either because of the volume, frequency, profitability, or status of the trader, are typically treated as taxable income under business or ordinary income, and may be taxed not only on disposal but also on an ongoing basis. A summary of treatments and country examples is set out in Box 2.1.

Box 2.1. Examples of different tax treatments depending on ownership or use of virtual currencies

A number of jurisdictions provide a different tax treatment for exchanges of virtual currencies depending on the owner or on the intended use. This distinction may either be made by the status of the owners (e.g. individual vs business owners), the nature or the amount of the trade (occasional vs regular trading, or the value of the trade), or on whether the activity is deemed to constitute a business activity. Such a distinction exists for tax purposes in Argentina, Australia, Austria, Belgium, Canada, Estonia, Finland, France, Greece, Ireland, Israel, Japan, Luxembourg, Netherlands, Slovak Republic, Slovenia, South Africa, Spain, Sweden and the United Kingdom.

Examples of the applicable tax treatments from among this group of countries include:

- Australia: the tax treatment varies, depending on whether the exchange is made by an individual, or a business that involves transacting with virtual currencies (Australian Taxation Office, 2020[64]):
  - Individuals are taxed on their gains from the disposal of the asset. The personal use exemption will not apply if the asset was held for investment purposes. However, individuals may qualify for a capital gains tax discount if the asset was held for longer than a year prior to disposal. Losses are ring-fenced to future capital gains and cannot be applied against future income.
  - If a person carries on a business that involves transacting with crypto-assets (whether trading, mining or exchange), the trading stock rules apply rather than the capital gains tax rules. Under these rules, the total proceeds from the sale of the crypto-asset are treated as ordinary income and the cost of acquiring the assets held as trading stock is deductible.
- Austria: the treatment depends on whether they are treated as business assets, investment assets, and other assets:
  - Income from the sale of virtual currencies held as business assets or associated activities is treated as ordinary income and subject to normal progressive tax rates under personal income taxes, or the corporate income tax rate, as applicable;

[19] In July 2020, the government of Korea released a draft law on the taxation of virtual currencies, proposing to treat them as other income (Korean Ministry of Strategy and Finance, 2020[150]). Under the proposed treatment, which would apply from October 2021, capital gains on these assets would be taxed on an annual basis at the 20% rate applied to other income. A total gain of less than KRW 2.5 million per year will not be taxed. (Bitcoin.com, 2020[151]) and (Cointelegraph.com, 2020[152]) also refer to these developments.

  - If virtual currencies are held as an investment asset, an individual must pay tax on them at either the lower capital tax rate for personal capital income, or the corporate income tax rate.
  - Other virtual currencies that are not business assets and are traded only occasionally are taxed under capital gains tax rules at full progressive rates if held for less than one year (with a de minimis exception if the gains are less than EUR 440 in that year) prior to sale, or untaxed if held for more than one year (Global Legal Insights, 2020[65])
- Belgium: if a person's professional occupation is trading virtual currencies, profits will be taxed as professional income, and will therefore be subject to progressive tax rates that range between 25 and 50 per cent in Belgium. However, if a Belgian resident makes gains on virtual currency transactions outside of the scope of his or her professional activity, the tax treatment is determined on a case by case basis depending on whether or not the transactions are seen to be part of the "normal management of private wealth", or a speculative transaction (Wolters Kluwer, 2018[66]). (Loyens & Loeff, 2018[67]) (Dekeyser & Associés, 2018[68]). The distinction between these cases is not clearly defined for virtual currencies. In the former case, the individual will benefit from a tax exemption; whereas in the latter case, gains resulting from virtual currency investments will be taxed as miscellaneous income, hence at a fixed rate of 33%.
- Canada: profits on the disposition or sale of business assets, or in cases where the currency is bought with the intention of profit, are treated as business income. Disposals other than business disposals are taxed as capital gains, with only half of the capital gain being subject to tax. In this case, losses are ring-fenced and can be used against capital losses or carried forward or backwards for the preceding three years (Canada Revenue Agency, 2019[56]).
- Estonia: the alienation and exchange of virtual currencies gives rise to capital gains at the flat tax rate of 20%, except where these are done in the course of trading. Income from trading in virtual currencies is taxed as business income, which is subject to personal income taxes as well as social security contributions.
- Japan: Japan distinguishes between the income generated by occasional trading and the income generated by trading as a business. Under Japanese tax laws, income derived from the occasional trading of virtual currency is in principle classified as miscellaneous income, while income derived from trading of virtual currencies as a business is classified as business income.

Finally, virtual currencies may also be exchanged in payment for goods or services, or wages. These transactions are treated as barter or reciprocal transactions for tax purposes in almost all respondent countries. The disposal of the token for goods and services gives rise to a taxable event for the owner of the virtual currency in all respondent countries except Estonia and those countries that do not consider any disposals to be a taxable event in relation to the token (Grenada, Italy, the Netherlands and Portugal, as well as for non-self-employed individuals in Switzerland).

For the recipient of a virtual currency in payment for a good, service or wage, all respondent countries that issue guidance on the question note that the receipt of a virtual currency does not change the underlying tax treatment that would have applied had the purchase been made in fiat currency. Therefore, a supplier who receives payment for goods and services in virtual currencies is required to include the value of the virtual currencies in their taxable income. Similarly, where wages are paid in virtual currencies, these are also taxable under personal income tax rules, either as fringe benefits or as wage income. For example, in Australia, payments received by individuals or businesses in the form of virtual currencies are taxable as income at the time of receipt. Virtual currencies received in payment for services are taxable as ordinary income at the time they are received; whereas the tax treatment of virtual currencies received in payment for services depends on whether they are paid under a salary sacrifice arrangement (in which case, they are treated as fringe benefits) or not (in which case it is treated as regular employment income and 'pay-as-you-go' withholding obligations apply).

Disposals other than for consideration

The disposal of virtual currencies where there is not an exchange for consideration is less often covered in the available guidance. This category of disposal includes gifting of tokens, inheritance, or their theft or loss.

In cases where a virtual currency is gifted, two treatments are possible. First, the gift may be treated as a disposal for tax purposes for the donor and can give rise to a taxable event under either income or capital gains tax rules, although exemptions may exist for donations to registered charities. Second, the gift may not trigger a taxable event for either party. In both cases, establishing the value, or basis, of the gift at the time it is made, is critical to the tax treatment.

An example of the first approach is seen in the United Kingdom, where the gifting of virtual currencies is a taxable event for the donor; on the other side of the transaction, the recipient is deemed to have received the gift at the market value at the time of donation, less any reliefs that were claimed by the donor when paying capital gains tax on the disposal of the asset. However, if capital gains tax is not payable on the disposal, for instance due to a trading or small business exception, the recipient may take on the basis of the donor and pay capital gains tax on the basis of the donor's acquisition cost when the virtual currency is subsequently exchanged (GOV.UK, n.d.[70]). Gifts to charities are not subject to capital gains tax.

The second approach is used in the United States, where a gift of less than USD 15 000 does not trigger a tax liability for the donor or the recipient (US Internal Revenue Service, 2019[71]). In this case, the basis for the recipient depends on both the basis of the donor and whether or not the recipient eventually disposes of the asset for a gain or loss. To determine whether the recipient has a gain, their basis is equal to the donor's basis, plus any gift tax paid by the donor. If a loss is claimed, the recipient's basis is equal to the lesser of the donor's basis or the fair market value of the virtual currencies at the time the gift was made. If the recipient cannot demonstrate the donor's basis, the basis applicable is zero (US Internal Revenue Service, 2019[72]). Gifts to charities do not result in capital gains or losses and may be able to be deducted against other income at the fair market value of the virtual currencies donated.

Finally, it is possible that virtual currencies may be lost or stolen. Virtual currencies can be lost when a private key is misplaced or forgotten, or on inheritance if the key is not shared or the inheritor did not otherwise have access to the wallet. A study by the Wall Street Journal indicated that an estimated 20% of Bitcoin tokens are lost (Wall Street Journal, 2018[73]). In addition, theft of virtual currencies has occurred on several occasions, either via stolen tokens, hacked wallets, hacked exchanges, or via decentralised finance applications. In 2020 alone, several such thefts have been recorded, including a theft of over USD 25 million in Ethereum, USDT and other tokens from Lendf.me and a USD 1.4 million theft of IOTA tokens following a hack of Trinity Wallets (CipherTrace, 2020[74]).

The possibility of losses or theft of a virtual currency gives rise to a number of questions from a tax perspective. Should a loss or theft be treated as a disposal (and capital loss) for the taxpayer? Are lost tokens able to be deducted from the value of an inheritance? There is very little guidance available on how these events should be treated for tax purposes and approaches differ in the few countries providing guidance. For example, in the case of loss or theft of a crypto-asset in Australia, the owner may claim a capital loss, provided they are able to present the evidence of their ownership. In the United Kingdom, theft is not considered to be a disposal and Her Majesty's Revenue and Customs (HMRC) considers that the individual continues to own the asset. Similarly, the loss of a private key is not considered a disposal, but a taxpayer can apply to have the loss recognised.

Box 2.2. Summary of income tax treatment of virtual currencies

For income tax purposes, almost all countries consider virtual currencies to be a form of property; most commonly, an intangible asset other than goodwill, a financial asset, or a commodity. The assets are therefore treated as capital gain generating assets in most jurisdictions, and in rare cases, as generating business or miscellaneous income.

There are a number of taxable events in the income taxation of virtual currencies, most of which occur on the disposal of a virtual currency for consideration. Although a small number of countries do not consider any exchanges made by individuals to be a taxable event, most countries consider exchanges made between virtual currencies and fiat currencies to generate a taxable event. Among these countries, a handful exempt exchanges between different token types from taxation, with the majority considering them to be taxable. Exchanges in payment for goods, services or wages are also treated as a taxable event in almost all countries, and the tax treatment of the underlying transaction remains unchanged. Finally, the plurality of respondent countries indicated that the receipt of a new token via mining occasions a taxable event, but a substantial minority indicated that the first taxable event would occur on disposal, with a cost basis of zero.

In many countries, the tax treatment of transactions in virtual currencies also varies depending on the status of the taxpayer. Occasional trades, or transactions made in a personal gains capacity, most commonly give rise to capital gains tax liabilities, and losses are ring-fenced to be applied against other capital gains. Where taxed under capital gains rules, reduced rates, or exemptions at the conclusion of the minimum holding period, lightens the tax treatment relative to systems where the gains are taxed as personal income. On the other hand, trading in a business capacity, or by businesses, gives rise to business or capital income, meaning that normal business tax rates apply and losses are more widely deductible.

Finally, disposals of virtual currencies other than for consideration, including gifting, theft and loss, are rarely covered in the guidance, and tax approaches vary across countries.

2.3. Value-added taxation of virtual currencies

The mining, exchange or disposal of virtual currencies may also have VAT consequences. As for income taxes, the definition of these assets is also particularly important in determining their VAT treatment. In contrast with income taxation, countries tend to treat virtual currencies as akin to fiat currencies in the VAT treatment of transactions involving their exchange or disposal. This treatment is in part due to pragmatism, given the consequences of treating these assets as barter transactions, and in the European Union (EU), has been heavily influenced by a decision of the ECJ. There is a relatively broad consensus among countries as to the VAT treatment for transactions involving virtual currencies. There is greater divergence among countries in the treatment of “related” or “back-office” services, such as online wallet services and exchange services. This section examines the development of the VAT treatment of virtual currencies in EU countries before examining their treatment in other jurisdictions.

2.3.1. VAT Treatment in the European Union

The EU VAT Directive from 2006 regulates VAT systems in EU member countries (Council of the European Union, 2006[75]). It aims to harmonise VAT systems within the EU VAT area, defining taxable transactions, outlining required and permitted exemptions as well as boundaries for applicable standard and reduced

rates, and regulating the legal framework of VAT systems and their implementation. Article 2 of the EU VAT Directive sets out which transactions are subject to VAT. It states:

> *"1. The following transactions shall be subject to VAT:…*
>
> *"…(a) the supply of goods for consideration within the territory of a Member State by a taxable person acting as such…*
>
> *"…(c) the supply of services for consideration within the territory of a Member State by a taxable person acting as such."*

In 2014, the EU Group on the Future of VAT (European Commission Value Added Tax Committee, 2014[76]) – an informal expert group composed of representatives of EU Member States' tax authorities – discussed the status of virtual currencies (and specifically Bitcoin)[20] under the EU VAT Directive. Under the EU VAT Directive, depending on how these transactions are characterised, they can be considered as out scope of VAT, as within the scope of VAT but exempt, or as taxable. For example, if considered to be electronic money, currency, a negotiable instrument, or a security, the exemption in Article 135(1) of the Directive could apply:

> *1. Member States shall exempt the following transactions:*
>
> *"…(d) transactions, including negotiation, concerning deposit and current accounts, payments, transfers, debts, cheques and other negotiable instruments, but excluding debt collection;*
>
> *"(e) transactions, including negotiation, concerning currency, bank notes and coins used as legal tender, with the exception of collectors' items, that is to say, gold, silver or other metal coins or bank notes which are not normally used as legal tender or coins of numismatic interest;*
>
> *"(f) transactions, including negotiation but not management or safekeeping, in shares, interests in companies or associations, debentures and other securities, but excluding documents establishing title to goods, and the rights or securities referred to in Article 15(2);"*

The Group concluded that it was unlikely that virtual currencies could be considered to be e-money, a currency, a security or a voucher, however, it expressed some uncertainty over whether they would be characterised as a digital product or negotiable instrument.[21]

In 2015, a subsequent paper from the EU Value Added Tax Committee (European Commission Value Added Tax Committee, 2015[77]) – an advisory committee which can give guidance on the Directive's application – discussed the implications of characterising virtual currencies as either digital products or as negotiable instruments. This 2015 paper also addressed various challenges arising from the two potential approaches, including: the lack of an exchange rate; the complexity of compliance in barter transactions; anonymity; place of supply; users becoming taxable persons for VAT purposes; and the risk of carousel

[20] Although the Hedqvist decision and related discussions by the EU Value Added Tax Committee related primarily to the VAT treatment of Bitcoin, most EU countries have interpreted these as relating to all virtual currencies. Therefore, this section refers to virtual currencies generally.

21 Consideration as a voucher would have rendered the VAT treatment unclear but could lead to transactions in Bitcoin being considered a taxable supply of services under the VAT Directive and the exchange of Bitcoin for goods and services becoming a barter transaction with two reciprocal VAT supplies.

fraud.[22] Based on the analysis of the impacts of the two potential characterisations and the associated challenges, the 2015 paper concluded that virtual currencies are most appropriately treated as a negotiable asset, bringing them within the exemption in Article 135(1)(d).

In October 2015, the ECJ ruled on these issues in Skatteverket v Hedqvist (European Court of Justice, 2015[78]). Hedqvist intended to provide exchange services between virtual currencies (specifically, Bitcoin) and fiat currency, via an online platform and a company structure. The Swedish Revenue Law Commission had found that this would be a supply of an exchange service for consideration that was exempt under the Swedish law on VAT. Skatteverket, the Swedish tax authority, appealed and the ECJ was asked to rule on two questions: whether exchanges of virtual for fiat currency were a taxable supply under Article 2(1) of the EU VAT Directive; and if so, whether Article 135(1) of that Directive meant that those exchange transactions are VAT exempt.

The ECJ found that the transactions proposed amounted to a supply of services for consideration within Article 2(1) of the EU VAT Directive. To determine whether these supplies were exempt under Article 135(1), the ECJ first considered the general purpose of these exemptions, noting that Article 135 aims to avoid divergence between VAT systems, requiring that the exemptions were to be interpreted strictly. The ECJ also noted that the exemptions also have the goal of furthering the objectives of the Directive and ensuring compliance with the goal of fiscal neutrality. Therefore, it concluded that their purpose was to alleviate difficulties with establishing the taxable amount and with VAT deductions. Having established the general principles, the ECJ then considered the specific subsections (1)(d) to (f), which deal with the different types of financial transactions. The ECJ eliminated the possibility that the supply in question was captured by either (1)(d) and (1)(f), noting that the supply did not involve a financial account or debt, or a security. Instead it favoured the application of Article 135(1)(e), noting that:

> *"… the various language versions of Article 135(1)(e) of the VAT Directive do not allow it to be determined without ambiguity whether that provision applies only to transactions involving traditional currencies or whether, on the contrary, it is also intended to cover transactions involving another currency.*
>
> *"Where there are linguistic differences, the scope of the expression in question cannot be determined on the basis of an interpretation which is exclusively textual. That expression must therefore be interpreted in the light of the context in which it is used and of the aims and scheme of the VAT Directive…"*

On this basis, the ECJ held that virtual currencies were comparable to fiat currencies in that their sole purpose was to provide a means of exchange, and that both virtual currencies and fiat currencies gave rise to similar difficulties in determining the taxable amount and the amount of VAT deductible. The Court therefore ruled that transactions including the exchange of fiat currency for virtual currencies and vice versa, performed for consideration, are transactions exempt from VAT within the meaning of Article 135(1)(e) of the EU VAT Directive.

Following the Hedqvist decision, the EU Value Added Tax Committee re-considered its approach (European Commission Value Added Tax Committee, 2016[79]). As Hedqvist had already determined the

[22] In its 2004 Report to the Council and European Parliament (European Commission, 2004[145]) the European Commission defines carousel fraud as follows: "A so-called 'conduit company' A, makes an exempt intra-community supply of goods to a 'missing trader' B in another. This company B acquires goods without paying VAT and subsequently makes a domestic supply to a third company C, called the broker. The missing trader collects VAT on its sales to the broker but does not pay the VAT to the Treasury and disappears. The broker C claims a refund of the VAT on its purchases from B. Consequently, the financial loss to the Treasury equals the VAT paid by C to B. Subsequently, company C may declare an exempt intra-community supply to company A and, in turn, A may make an exempt intra-community supply to B, and the fraud pattern resumes, thus explaining the term 'carousel fraud' […] In order to distort VAT investigations, the goods will often be supplied from B to C via intermediary companies, called 'buffers". Since then, carousel fraud expanded to intangible commodity markets such as environmental and energy certificates.

exchange of virtual currencies for fiat currency, the paper examined four further scenarios: (i) supplies of goods and services, subject to VAT, remunerated by way of virtual currencies; (ii) services concerning the arrangement of transactions in virtual currencies (digital wallets); (iii) services concerning the verification of transactions in virtual currencies (i.e. mining); and (iv) services related to intermediation provided by exchange platforms for consideration. It summarised its findings in a table, set out in this paper as Table 2.3.

Table 2.3. Treatment of virtual currencies in EU Member States, following the decision in *Hedqvist*

Activity	Subject to VAT?	If so, exempt?
Use of Bitcoins for acquiring goods or services	*Out of scope*: No VAT should be levied on the value of the Bitcoins themselves.	
Supplies of goods or services, subject to VAT, remunerated in Bitcoins	*Taxable*: The supply of goods and services, subject to VAT and remunerated by way of Bitcoin, would for VAT purposes be treated in the same way as any other supply. VAT should therefore be levied on the goods or services provided.	
Services supplied by digital wallets	*Out of scope*[1]: A large majority of the services supplied by digital wallet providers are free of charge, which sees these transactions falling outside the scope of VAT.	
	Taxable: If, however, some digital wallet providers ask for payment of fees in exchange for their services, it seems that the transaction would be taxable.	E*xempt:* Such services could however be seen as exempt pursuant to Article 135(1)(e) of the VAT Directive, on the grounds of them being transactions directly concerning currency. *Not exempt*: It seems that services supplied by digital wallet providers could not be exempt pursuant to Article 135(1)(d) of the VAT Directive.
Mining activities	*Out of scope* [1]: The fact that the payment of a transaction fee by a Bitcoin user is not a necessary condition for successfully sending Bitcoins (and thus for receiving a verification service supplied by the miner) may be indicative of there not being a direct link between the consideration and the service. Besides, the provision of a mining service does not create for the miner the right to receive a consideration in exchange, which could imply the non-existence of a legal synallagmatic relationship between him and the recipient of the verification services (the user whose transaction request the miner has validated).	
	Taxable: New bitcoins received automatically by the miner from the Bitcoin system every time that a verification service is supplied could possibly be seen as constituting a consideration for a taxable service. Despite the fact that Bitcoin transactions carried out for free are in theory possible, in practice Bitcoin users pay fees (used as a default by most digital wallets); and it seems almost impossible to imagine users would be willing to wait days or weeks, before a transaction is verified (which could be the case if no fee is paid).	*Exempt:* Mining activities could be seen as exempt pursuant to Article 135(1)(e) of the VAT Directive, on the grounds of them being services directly concerning currency. *Exempt:* Mining activities could be treated as exempt pursuant to Article 135(1)(d) of the VAT Directive on the basis of them fulfilling in effect the specific, essential functions of an exempt supply (the transfer of bitcoins itself).
Services related to intermediation supplied by exchange plat-forms	*Taxable:* Services for consideration supplied by exchange platforms acting as intermediaries would be taxable.	*Not exempt:* Exchange services could not be seen as exempt pursuant to Article 135(1)(e) of the VAT Directive.

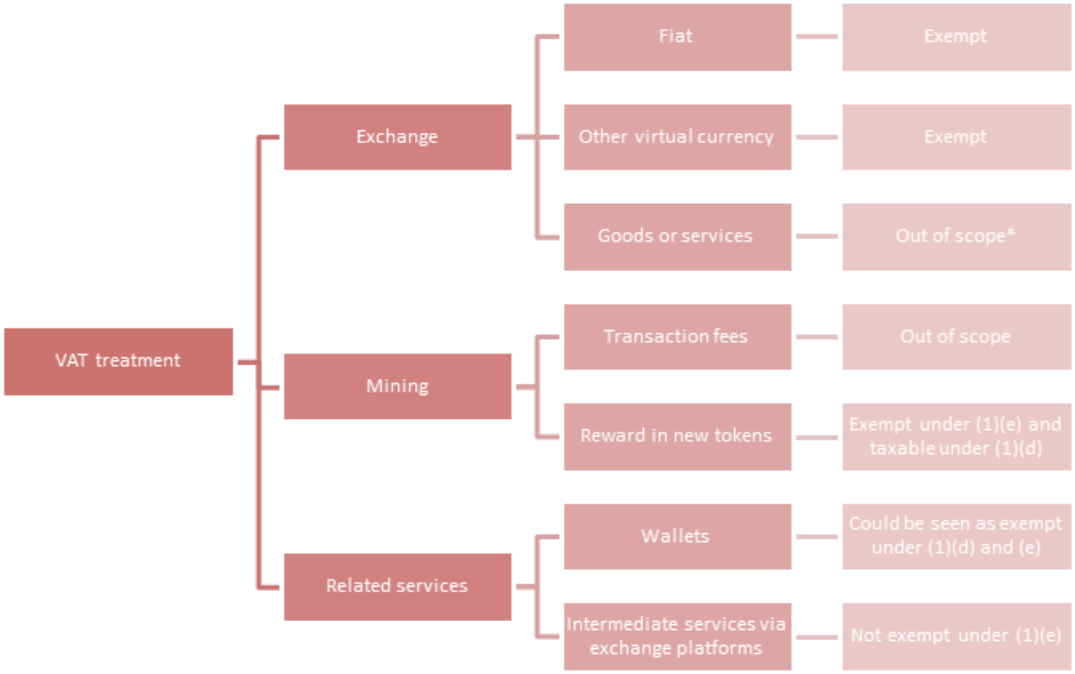
Notes: (1) Unless Article 26(1)(b) of the VAT Directive applies.
Source: Replicated from: (European Commission Value Added Tax Committee, 2016[79])

Unlike ECJ judgements, the advice of the EU's Value Added Tax Committee is not legally binding on Member States. Therefore, Member States can depart from the analysis provided by the EU's Value Added Tax Committee in their practice or legislation. Most Member States seem, however, to adhere to this

analysis as shown in the minutes of the meeting of the VAT Committee in September 2016 (European Commission Value Added Tax Committee, 2016[80]).

The decision in Hedqvist and the subsequent discussion in EU's VAT Committee, would result in the VAT treatment stylised in Figure 2.3 being applied to virtual currencies in EU Member States.

Figure 2.3. Stylised description of VAT treatment of virtual currencies in EU Member States



* The supply of the good or service remains taxable under normal VAT rules.
Note: the Figure should be read as considering the VAT treatment of virtual currency in the case of (i) exchange for fiat currency, for other virtual currency or for goods or services, (ii) mining resulting in transaction fees or reward in new tokens, and (iii) the related services provided to the virtual currency holder such as wallets or intermediate services via exchange platforms.
Source: OECD Secretariat, based on the Hedqvist decision and (European Commission Value Added Tax Committee, 2016[79]) =.

Following these discussions, the VAT treatment of exchanges in virtual currencies is relatively consistent across EU Member States. However, there remain some differences in the treatment of mining income and the treatment of related services:

- For example, mining activities are typically treated as out of the scope of VAT (for example, in Germany, Ireland, Slovenia and Sweden), as both the mining rewards and the transaction fees are not regarded as having a sufficient link between the payment and the activity (Bundesministerium der Finanzen, 2018[81]). In France, however, revenue from mining activities is considered taxable as a supply of services (Ecole d'Ingénieurs Paris-La Défense ESILV, 2019[82]).
- Similarly, there is some variation in the approach adopted by EU Member States with regard to the taxation of related services. For instance, Germany treats the provision of wallet services for consideration, and of exchange services offered to third parties, as taxable under VAT; whereas other countries provide an exemption for one or both of these related services: Slovenia treats the provision of wallet services to be closely related to the exchange of virtual currencies and therefore exempt from VAT, while treating the provision of online exchange services as taxable at the

standard VAT rate (Cop and Klobasa, 2019[83]). In Italy, exchange services are treated as exempt from VAT, in line with the treatment of other foreign currencies (The Block, n.d.[53]).

Other crypto-assets may be treated differently for VAT purposes in the EU. It should be noted that the distinction between payment instruments and vouchers is relevant in the EU Member States, as it affects the VAT treatment of related services (payment services being exempt). Therefore, the distinction between payment instruments and vouchers may also be relevant when characterising and drawing the line between the different types of tokens (especially between payment and voucher-like utility tokens). In addition, according to the established legal praxis of the ECJ, a supply of services rendered for consideration is subject to VAT when a direct link can be established between the service provided and the consideration received. For instance, in an ICO or an airdrop where utility tokens are issued it may be difficult to identify the link between the service rendered and the corresponding price.

2.3.2. VAT Treatment in other jurisdictions

A similar approach is followed in most jurisdictions outside the EU, in that exchanges of virtual currencies for fiat currency or other virtual currencies are not treated as a VAT event. While in Europe, this results from the Hedqvist decision, in other jurisdictions the reasons are not always clearly articulated. Often no reasons for this approach are given, although it is likely that in many cases, the approach has been adopted for pragmatic reasons. In these jurisdictions, the treatment of mining and of related services is also more diverse than the treatment of exchanges.

Among European countries that are not members of the EU, the VAT treatment of virtual currencies closely follows the decision in Hedqvist:

- In the United Kingdom, mining is treated as out of the scope of VAT, on the basis that it does not constitute an activity for VAT purposes due to the lack of a link between the services provided and the consideration, as well as the lack of a customer for the mining services. Similarly, exchanges in virtual currencies are out of scope, although VAT remains payable on the supply of the good or service for which virtual currencies are exchanged. Services provided by exchange platforms are exempt, in line with the broader treatment of financial services.
- In Norway, the use of virtual currencies as a means of payment, as well as the exchange of virtual currencies, are typically exempt from VAT under the exemption for financial services, provided that the virtual currency is being used as an alternative means of payment. Rewards from mining are exempt from VAT, but persons who sell computing power to others to permit mining are not exempt as the provision of computing power is not covered under the exemption for financial services (The Norwegian Tax Administration, n.d.[84]). The approach in Norway was adopted following the Hedqvist decision; previously, Norway had considered that there was no exemption for VAT in respect of virtual currencies (The Norwegian Tax Administration, 2013[85]).
- In Switzerland**,** transactions involving virtual currencies are out of the scope of VAT, if exchanged for other forms of virtual currencies or for fiat currency. Similarly, exchanges for other goods and services are subject to VAT only on the supply of the good or service, but are not a barter transaction (Confédération suisse, 2020[86]).

Outside Europe, almost all countries follow a similar approach in excluding exchanges in virtual currencies from VAT, and in not treating the purchase of goods and services with virtual currencies as a barter event, but as a taxable sale. For example:

- In Australia, use of virtual currencies was previously treated as a taxable barter event. The law was amended from 1 July 2017 to treat the purchase of goods and services with virtual currencies as not being a barter event, and to treat exchanges of virtual currencies and/or fiat currency as exempt from GST as financial services.

- In Colombia, only the intermediation fee from sales is subject to VAT. Virtual currencies are treated as personal property and are therefore not subject to VAT.
- In Israel, individual investors in virtual currencies are not liable for VAT, but anyone who engages in mining will be classified as a dealer and could be subject to VAT. Businesses trading in virtual currencies are classified as financial institutions for tax purposes and are exempt from VAT, so VAT on expenses is not deductible and an additional 17% wage and profit tax applies.[23]
- In Japan, before 1 July 2017, sales of virtual currencies were subject to VAT if the transferor was located in Japan. Since 1 July 2017, VAT has not been charged on exchanges provided that the relevant token meets the definition of crypto asset under the relevant law (Bitcoin News, 2017[87]). In effect, virtual currencies in Japan are treated in the same way as sovereign currencies in terms of VAT.
- In Singapore, before 1 January 2020, the exchange of a virtual currency was regarded as a taxable supply of services for GST purposes, unless it met the definition of an exempt financial service. Therefore the exchange of virtual currencies, whether for other virtual currencies or fiat currencies, together with the issuance of ICOs for consideration, gave rise to a GST liability. Moreover, their use in payment for goods and services gave rise to a barter trade. One implication of this treatment was that any local trader may have been required to register for GST purposes if they exceeded the relevant threshold. However, this treatment was changed as of 1 January 2020 and virtual currencies are now treated as exempt supplies if exchanged for other virtual currencies or for fiat currencies, and are an excluded transaction if used as payment for goods and services. As for the supply of goods and services made in exchange for virtual currencies, GST remains chargeable on that supply. The supplies of services by intermediaries also remain taxable, as does a mining service rendered to identifiable parties for consideration (Inland Revenue Authority of Singapore, 2020[88]).
- In South Africa, crypto-assets are included under the financial services exemption, which renders the issue, acquisition, collection, buying, selling or transfer of ownership to be exempt from VAT – as per a 2018 guidance document from the South African Reserve Bank, confirmed by a 2019 Parliamentary response.

New Zealand is one of the very few countries to take a different approach to the VAT treatment of virtual currencies, although the current approach is under review with the goal of providing simplicity and certainty. In New Zealand, the GST treatment of crypto-assets that are traded or sold is determined on a case-by-case basis and they may be fully taxed, exempt or zero-rated, depending on the circumstances. In a discussion document currently under consideration, the government would treat exchanges in crypto-currencies as exempt from GST and is seeking feedback on whether this should apply to all transactions or just those with a New Zealand-resident recipient. Related services that are not in themselves supplies of crypto-assets (such as mining, exchange services or general business or computing services) will continue to be subject to the existing GST rules and treated as either subject to GST at the standard rate (if provided to residents) or as a zero-rated supply to a non-resident (New Zealand Inland Revenue, 2020[89]).

[23] Taxation of Decentralised Payment Systems Activities (referred to as 'Virtual Currencies'), Israel Tax Authority, 2018, described in (Artzi, 2018[143]).

Box 2.3. Summary of VAT treatment of virtual currencies

1. The VAT treatment of virtual currencies is more consistent across countries than income taxes. In almost all countries, the exchange of virtual currencies is not subject to VAT. This applies whether the exchange is made for fiat currency or other virtual currencies. The pure activity of using virtual currencies to acquire goods or services is also outside the scope of VAT, and thus no VAT should be charged on the value of the virtual currencies themselves. Virtual currencies represent only a means of payment and the transaction is not a barter. However, the supply of taxable goods and services paid with virtual currencies remain subject to VAT as appropriate. With a few exceptions, for example in France and Italy, the receipt of new tokens via mining is also not chargeable under VAT. Another impact of this treatment is to avoid practical difficulties associated with treating these transactions as taxable under VAT rules, including the complex record keeping needed to establish values and deductions, and the potential inclusion of individuals or small dealers under VAT registration rules. In EU countries, the decision in Hedqvist, treating virtual currencies as akin to currencies for the purpose of the VAT Directive, has also been responsible for the tax treatment currently applied.

2. Services related to virtual currency exchanges but which are not integral to these exchanges have a more varied treatment across countries. VAT is not chargeable in the vast majority of countries, typically because it is considered to be covered by exemptions or provisions relating to financial services. In other countries, particularly outside the EU, services related to the exchange of virtual currencies are subject to the normal VAT rules as a supply of taxable services. In relation to these services, consistency with countries' treatment of traditional payment instruments and financial services is important as well as consideration of the practical implications of different treatments for taxpayers in terms of registration, record-keeping, and valuation of the virtual currency.

2.4. Property taxes and virtual currencies

As virtual currencies are typically considered to be property for tax purposes, with the possible exception of VAT, they are also likely to be subject to property taxation in countries that levy inheritance, gift, wealth or transfer taxes, although the guidance available rarely provides information on whether and how these taxes apply to virtual currencies.

Inheritance or estate taxes exist in several respondent countries, including Belgium, Brazil, Bulgaria, Denmark, Finland, France, Germany, Iceland, Ireland, Korea, Netherlands, Spain, the United Kingdom and the United States.[24] Among the respondent countries that have issued guidance covering the application of these taxes to virtual currencies are:

- The United Kingdom, which considers virtual currencies to be property for the purposes of the inheritance tax law (HM Revenue & Customs, 2019[58]). They will therefore count toward the total value of the estate, which will be taxed if it exceeds GBP 325 000 (GOV.UK, n.d.[70]) and the recipient will pay capital gains on increases in value from the date of receipt. Although not stated explicitly, virtual currencies are also presumably included in the calculation of whether a gift made within seven years prior to death exceeds the inheritance tax threshold in the United Kingdom. (GOV.UK, n.d.[90])
- In Korea, although official guidance is yet to be released, the government indicated at the end of 2017 that virtual currencies and other virtual assets could be considered taxable as for other property under inheritance tax rules (Korean National Tax Service, 2017[91]).

[24] Global Revenue Statistics Database: http://www.oecd.org/tax/tax-policy/global-revenue-statistics-database.htm.

- In Finland, virtual currencies received via inheritance are taxable, at their acquisition cost. Subsequent gains on disposal are also taxable under capital gains taxes (Veroskatt, Finnish Tax Administration, 2020[92]).

Virtual currencies are also included as assets within the definition of wealth taxes, in the handful of countries where these taxes exist. This is the case, for example, in Belgium, Luxembourg, Norway, Spain and Switzerland:

- In Luxembourg, the wealth tax applies to Luxembourg resident companies and to non-resident companies that have a permanent establishment in Luxembourg. It is levied at a rate of 0.5% per annum. For this tax, the virtual currencies should be valued in accordance with the provisions of the Bewertungsgesetz (Luxembourg evaluation law), i.e. at their fair market value. The non-resident companies are only taxed on their net wealth held in Luxembourg (Administration des Contributions Directes Luxembourg, 2018[93]).
- In Switzerland, virtual currencies held by individuals are taxable capital under movable capital assets and are subject to cantonal wealth taxes. For the purpose of tax assessment, virtual currencies must be converted to Swiss francs. The conversion rates for certain virtual currencies such as Bitcoin or Ether are provided by the Federal Tax Administration (FTA). If the FTA does not determine a year-end market value, the virtual currencies must be declared at the year-end price of the trading platform through which the buying and selling transactions are executed, or failing that, at the price for which they were purchased (Swiss Federal Tax Administration, 2019[64]).

Where they exist, transfer taxes typically do not apply to the transfer of virtual currencies as they do not fall within the definition of assets on which these taxes apply in the respondent countries. Gift taxes, which includes taxes on the value of a gift made or received,[25] are often designed as a backstop for taxes on inheritance, and may be taxable only above a particular value threshold, as demonstrated above in the United Kingdom. While the application of these taxes to virtual currencies is rarely covered in the guidance, it is likely that they will be considered taxable under gift taxes if they exceed the relevant exemption thresholds.

[25] The taxation of gifts under capital income taxes is covered in the section on income taxes.

3 Common tax policy challenges and emerging issues

As noted, virtual currencies pose a number of unique challenges for policymakers for a variety of reasons, including their fast-moving values, decentralisation, pseudo-anonymity, and hybrid characteristics. This Part discusses the common challenges seen in defining or applying the tax treatment in a number of jurisdictions before discussing the implications of several emerging developments in the forms of virtual currencies available in the marketplace.

3.1. Common challenges in taxing virtual currencies

3.1.1. Valuation and basis

The price of virtual currencies fluctuates significantly. On one hand, it has been reported that Bitcoin's two-year return (between 2017 and 2019) was 457%, which represents a much greater growth than major stocks (Yahoo Finance, 2019[94]), which is attractive to investors in spite of the financial risks. On the other hand, Bitcoin, Ethereum and other virtual currencies also faced a dramatic decrease in value between December 2017 and February 2018 which happened very quickly. Such a high level of volatility makes valuation complex, although it is key for the calculation of the overall capital and of capital gains, and therefore, in establishing the tax consequences under income taxes, VAT/GST and property taxes.

There are practical difficulties due to the high fluctuation in value even across a short time frame, that records may not be kept with the necessary precision, and that exchange platforms may have different prices for the same virtual currency. In addition, valuation relies on complex records of purchase and disposal prices and it may prove challenging for taxpayers to keep pricing information over a long-time period, especially if their wallets include various types of virtual currencies or the same types of virtual currencies are bought at different times for different prices. Questions therefore arise as to how valuation should be carried out, and as to who should be responsible for calculation and recordkeeping.

From a tax perspective, valuation is important on receipt of a new token, whether via mining, forging, exchange or gift, in order to calculate either the income immediately taxable (in the event that the acquisition occasions a taxable event) or as the basis, or deductible amount, when calculating the capital gains on disposal. Valuation is also important in the case of hard forks, for instance to determine the value of the new virtual currency when acquired, for the same purposes. Therefore, accurate record keeping of purchase dates and values of particular virtual currencies is important alongside records of their acquisition and disposal values.

Overall, guidance on valuation for tax purposes appears to be limited and where such guidance does exist, it acknowledges the difficulties in assessing the value of virtual currencies. To minimise the practical difficulties, some countries give taxpayers a certain discretion to estimate the value themselves: even when they prescribe particular methods of valuation, there may be a fall-back option allowing owners of virtual currencies to make their own valuation if no other method is viable. For instance, the Irish tax authority's guidance (as updated in April 2020) states that "unlike shares or commodities the value of virtual currencies

may vary between exchanges. Therefore, there is not always a single 'exchange rate' for virtual currencies. A reasonable effort should be made to use an appropriate valuation for the transaction in question." (Ireland's Revenue Commissioners, 2020[95]) This is also the case in Lithuania,[26] where available information and comparable data on the market may be used by taxpayers, so that the accounting policy for determining the value and the rate used can be left to the entity's discretion. A similar discretion is left to taxpayers in New Zealand, where they must use conversion rates from a reputable exchange with a reasonable trading volume and apply a consistent exchange and conversion approach.[27]

Where more detailed guidance exists, it varies based on the nature of the transaction or exchange. Depending on the transaction, the value to be retained to determine capital gains or losses may be based on the value indicated on exchange platforms, the value of fiat currency or of the fair market value of the goods and services exchanged for. In the case where a taxpayer has bought more than one batch of the same virtual currency, countries may adopt specific valuation approaches. These include:

a Specified units may be sold, provided that they can be identified by the owner.

b Deemed chronological order, based on the 'First-in-first-out' (FIFO) accounting principle.

c Pooling may be allowed within a batch of virtual currencies of the same kind.

For instance, the United States allows taxpayers to either identify unique units of virtual currencies to be sold or exchanged – if they can specifically indicate the basis and holding period of the units involved in the transaction, by documenting the unique identifier associated with it such as a private or public key, address or records showing the transaction information (e.g. through the wallet) (US Internal Revenue Service, 2019[72]), otherwise they are deemed to have been disposed of starting from the earliest unit purchased (FIFO approach). The US Notice 2014-21 provides limited guidance regarding valuation. It provides that:

> *"If a virtual currency is listed on an exchange and the exchange rate is established by market supply and demand, the fair market value of the virtual currency is determined by converting the virtual currency into U.S. dollars (or into another real currency which in turn can be converted into U.S. dollars) at the exchange rate, in a reasonable manner that is consistently applied." (US Internal Revenue Service, 2014[96])*

A similar notion is used in Singapore's guidance. When virtual currency is exchanged for goods and services, taxpayers should report the "open market value" of the goods and services – defined by Singapore's GST Act as the consideration in money that would be payable by an unrelated party. For exchanges of virtual currency to other virtual currencies, the taxpayer may use "an acceptable exchange rate prevailing at the time of supply" as provided by exchange platforms or providers such as Google Finance or Reuters. In the last resort, the exchange rate can also be agreed between parties (Inland Revenue Authority of Singapore, 2019[97]).

In Finland, the Business Tax Act provides that the acquisition cost of assets is determined on a FIFO basis, but allows the taxpayer to prove the actual acquisition cost of the units disposed of as an alternative. The Finnish tax authority guidance indicates that the same treatment applies to virtual currencies – using the exchange rate of the day of the transaction, or the rate agreed between the parties. (Veroskatt, Finnish Tax Administration, 2020[92]).

The United Kingdom allows pooling of virtual currencies in the same way as is permitted for shares and securities, so that the payment for all token units is grouped to provide a pooled allowable cost basis. An HMRC 2019 Policy Paper (UK HM Revenue & Customs, 2019[98]) provided that, as in the case of shares and securities, virtual currencies must be pooled instead of tracking the gain or loss for each token unit. The pooled allowable costs associated with each pool (one pool for one type of virtual currency) varies as

[26] Survey response

[27] Survey response

token units are acquired and sold – in the latter case, it is considered as a 'part-disposal' and results in a deduction of a corresponding share of the pooled allowable costs for the purpose of calculating the capital gain or loss.

In 2019, the Australian Taxation Office issued a "legislative instrument" operating in relation to Australia's goods and services tax (GST) that provides a method entities must use to convert consideration expressed in a given virtual currency into AUD for valuation and reporting purposes (Australian Federal Register of Legislation, 2019[99]). Guidance exists as to the conversion day – the date that the virtual currency is converted into AUD, the exchange rate – obtained from the exchange platform, the virtual currency website or an agreed rate between the supplier and the recipient – as well as the basic formula to be used in order to determine the value of the taxable transaction (Australian Federal Register of Legislation, 2019[100]).

Mining raises challenges for valuation purposes. The acquisition cost when a virtual currency is received as a reward without consideration in exchange is harder to determine. It can be the corresponding value in fiat currency if a market already exists for this type of virtual currency. For instance, the UK guidance (UK HM Revenue & Customs, 2019[98]) states that the value in GBP of the awarded virtual currency will be taxable with deduction of the relevant expenses. Similarly, the US Notice 2014-21 (US Internal Revenue Service, 2014[96]) requires that the fair market value of the mined token be determined in USD as of the date of receipt. Otherwise, the value could only be based on the cost of generating the unit of virtual currency (including energy consumption), although this would be complex to calculate (as mentioned in (EY, 2019[101])).Similarly, according to Australia's guidance as updated in March 2020 when a unit of virtual currency cannot be valued, the fair market value at the time of transaction should be sought (Australian Taxation Office, 2020[102]).

Valuation should in theory be easier to determine in the case of stablecoins, as their face value is more stable; as a backup, they can also be valued by reference to the value of the underlying assets. It should also be easier for CBDCs as they would have a similar value to the corresponding fiat currencies: in this case, the valuation would be made on the same basis as for any foreign currency.

As for reporting, to date taxpayers – whether individuals or entities – are in most cases in charge of recordkeeping and of declaring the information to the tax authorities through their tax returns. This in itself can prove challenging, but is required regardless of whether a pooling or a FIFO approach is required from official guidance. Some country guidance indicates the information required for reporting, for instance in Argentina, in Australia and in the United Kingdom, but this is far from common. In Argentina for instance, the General Resolution 4614/2019 (Administración Federal de Ingresos Públicos, 2019[103]) imposes a reporting obligation on subjects who manage, control or process movements of assets through electronic or digital management platforms, on behalf of human or legal persons. Overall, it is probable that a substantial volume of transactions remain unreported. However, to promote both simplicity for taxpayers and improved compliance, a framework by which exchange platforms are also responsible for both recordkeeping and for transmitting information to the domestic tax authorities, may be advantageous.

3.1.2. Taxation of hard forks

As discussed in Section 1.2 a change in the underlying protocol of a token results in a chain split, or fork, requiring users to update the protocol software they use. If the fork results in a new token being operated under the amended protocol, with the existing token continuing to operate on the previous protocol, this is referred to as a hard fork. Following a hard fork, holders of the existing token will receive additional tokens under the new protocol, which can give rise to a taxable event.

Although guidance on hard forks is rare, three different treatments of the new virtual currencies for tax purposes are seen among OECD countries:

1. No taxable event on receipt, but taxed under capital gains on disposal: this is the most common approach, seen in Austria, Finland and the United Kingdom. Under this approach, the receipt of

tokens following the hard fork does not give rise to a taxable event and the receipt of new tokens is not treated as taxable income for the recipient. Instead, the new tokens are taxed under capital gains rules on disposal, with differing approaches to calculating the basis. For instance:

a. In Austria, the cost basis for the new tokens is zero and the cost of acquiring the existing tokens remains unchanged. The date of acquisition of the old tokens also applies to the new tokens, so gains from the new token are taxable only if they are disposed of before the one-year holding test under the capital gains tax expires (Bundesministerium, 2020[104]).
b. In Finland, similarly, the value of the new tokens is taxable on disposal under capital gains tax rules, and the acquisition cost of the new tokens for capital gains purposes is zero. The acquisition cost of the original tokens is unchanged (Veroskatt, Finnish Tax Administration, 2020[92]).
c. In the United Kingdom, which takes a pooling approach to the calculation of capital gains (as described in Section 3.1.1) the basis cost of the new tokens is derived from the original crypto-assets already held. The new virtual currencies received after a hard fork are placed in their own pool, separate from the pool for the original token type (HM Revenue & Customs, 2019[58]).

2. A taxable event occurs and income received at the time of the hard fork: this approach is seen in the United States, where a hard fork is treated as a taxable event if new virtual currencies are received, whether it is through an airdrop or some other kind of transfer. The value of the new tokens received is therefore treated as taxable income on receipt (i.e. when they are recorded on the blockchain). The Internal Revenue Service (IRS) indicate that it is necessary for the taxpayer to have dominion and control over the new tokens, i.e. that the receiver has the ability to transfer, sell, exchange or dispose of the virtual currency. No taxable income is received when a soft fork occurs (US Internal Revenue Service, 2019[72]).
3. Differential treatment of hard forks depending on whether virtual currencies are used in investment or business: this approach is seen in Australia. Virtual currencies that were held as investments do not generate income (either ordinary or capital gain income) at the time of a hard fork. The new tokens rather generate a capital gain on their disposal, with a cost base of zero. If held for more than one year, the discounted capital gains tax rates may apply. However, a hard fork in relation to virtual currencies that are held in the course of a business are treated as trading stock and must be accounted for as taxable income within the income year in which the new tokens are received (Australian Taxation Office, 2020[61]).

Hard forks give rise to a number of other considerations for tax purposes. Under any tax treatment, a question arises about whether and when the taxpayer has effective control of the new token type. Although the new tokens can be deemed to be received when they are entered on the blockchain, situations of difficulty can arise if an individual holds virtual currencies through an exchange that does not recognise the new virtual currency, rendering them unable to be received, used and sold.[28] It is possible that an individual will be considered to have received property or income for tax purposes but be unable to dispose of the assets. The United Kingdom notes that situations like this will be addressed on a case by case basis. This situation is less problematic when the gains from new virtual currencies are taxable on disposal than when the income is taxable immediately. An alternative approach that may alleviate this question is to consider the new virtual currencies as received only when the user exercises dominion and control, for example by changing the wallet in which the tokens are stored, or by disposing of the assets.

[28] As occurred for instance with the Bitcoin hard fork of July 2017 when the newly created token, Bitcoin Cash, was at first not supported by the Coinbase exchange platform, meaning that individuals holding Bitcoin in a digital wallet stored with Coinbase would not be entitled to receive the new Bitcoin Cash tokens. Coinbase reversed its position a number of days later, but delayed the availability of the new tokens for six months (Medium - The Coinbase Blog, 2017[147]).

Where new virtual currencies are considered to generate taxable income on receipt, further difficulties may arise. Firstly, the taxpayer may be deemed to have a tax liability after taking no action to generate or receive the new virtual currency types. Secondly, incurring a tax liability in this way can cause liquidity problems as it is not necessarily an anticipated event, rendering the taxpayer liable to making an unexpected tax payment without any increase in cash-flow. Finally, if the value of the new virtual currencies decreases sharply after they are issued, the capital loss may not be able to be recognised for tax purposes or deductions in respect of that loss may be restricted or delayed. Difficulties of this kind may arise with other types of assets in a tax system that treats the receipt of property as a taxable event, and therefore may be inherent in the tax rules of such a system.

3.2. Emerging developments related to virtual currencies and their tax implications

3.2.1. Stablecoins

Objectives and challenges of stablecoins

Stablecoins, which are defined by the FSB as "crypto-assets that aim to maintain a stable value relative to a specified asset, or a pool or a basket of assets" (Financial Stability Board, 2020[105]), were first introduced in 2014 with NuBITS – built on the Peercoin platform which is one of the earliest using a "proof of stake" mechanism (European Central Bank, 2019[106]). They aim to provide an alternative type of virtual currency by minimising volatility, potentially allowing them to act more easily as a means of payment and a store of value. Stablecoins are a form of virtual currency that also rely on cryptography for holding and transfer purposes but that intend to maintain a stable price vis-à-vis a given benchmark, which most often is provided by a fiat currency (or a basket of fiat currencies), a commodity, another virtual asset or an algorithm.

Stablecoins intend to improve the efficiency of cross-border payment services, and to reconcile features of both fiat and virtual currencies. These include the features of fiat currencies on the one hand, in terms of being legal tender and the stability their purchasing power and the features of virtual currencies on the other (i.e. decentralisation and anonymity). The stablecoin tokens are typically stored electronically in a distributed ledger and may represent a claim on the issuer depending on the approach adopted – this is the case when the stablecoin is linked to a single fiat currency.

Stablecoins' characteristics can differ. They can be "permissionless" (anyone can validate a transaction on the underlying ledger) or "permissioned" (only selected entities can validate), "public" (anyone can use the ledger for transactions) or "private" (only certain entities can initiate transactions) (FATF, 2020[107]).

Challenges related to stablecoins are increasingly high on the political agenda, in particular of the G20 and the G7. The G7 established a Working Group on Stablecoins, which presented a report together with the Bank for International Settlements (BIS) and the IMF on Investigating the impact of global stablecoins in 2019 (G7 Working Group on Stablecoins, 2019[108]). The report concluded that stablecoins were posing legal, regulatory and oversight risks related to sound governance, money laundering, integrity of payment systems, operational resilience, market integrity and tax compliance among others. The French central bank, the Banque de France, in a study from March 2020 (Banque de France, 2020[109]), asks whether stablecoins can be stable without giving up decentralisation. The study considers that stablecoins, which could reach a global scale, pose serious challenges for financial stability and monetary policy. In terms of financial stability, stablecoins create a single point of failure through the concentration of financial transactions in a blockchain and, in terms of monetary policy, their issuance could lead to a decrease in demand for reserves in the reference fiat currency. The ECB considers that the asset management function of stablecoins presents particular risks to financial stability (European Central Bank, 2020[110]).

Stablecoins are made increasingly available by service providers, as shown by (Cambridge Centre for Alternative Finance, 2020[111]). With an overall market capitalisation of USD 10 billion as of May 2020 (doubling from 2019 as reported by Forbes) (Forbes, 2020[112]), the stablecoin market is developing quickly and remains dominated by Tether (85% of the total market share) (Crowdfund Insider, 2020[113]), noting however that Tether's volatility is high – it is held for a shorter time frame, on average, than other virtual currencies and that its issuer has not provided details on the mechanism by which Tether's supply is increased and decreased (Bloomberg, 2019[114]). The three largest stablecoins (Tether, USD Coin and TrueUSD) are all pegged to the USD. But larger initiatives such as Libra could accelerate the rise of global stablecoins (see Box 3.1).

Box 3.1. The Libra stablecoin

The most well-known stablecoin project to date is Facebook's proposal to introduce Libra, presented in June 2019 with the publication of a White Paper (The Libra Association, 2019[115]) presenting it as a global currency "designed and governed as a public good", and backed by a reserve of "high quality liquid assets" including fiat currencies and short-term government securities. Such a reserve of assets should preserve its intrinsic value and ensure the stability of its price over time. The reserve will represent the consideration given by resellers to purchase Libra, and in turn, the interest earned on the reserve will serve to cover the costs of the overall system. Libra would be issued and governed by the Libra Association which would be responsible for the approval of transactions on a permissioned blockchain. The Libra stablecoins would therefore not be created through a mining process, but would be released by the Libra Association once purchased by authorised resellers against payment in fiat currency.

Libra has faced questions and concerns from governments and regulators over its functioning and the possible threat it represents to the global monetary system – as expressed by G20 Finance Ministers and Central Bank Governors in their Press Release on Global Stablecoins from October 2019, which noted the policy implications and regulatory risks of stablecoins.[29]

The Libra Association is continuing discussions with stakeholders and presented a revised White Paper in April 2020 (The Libra Association, 2020[116]), proposing some changes to its approach. In particular, the revised approach would now offer several single-currency stablecoins (i.e. pegged on USD, EUR, GBP, etc.) in addition to its initially planned multi-currency one.

The launch of Libra, previously scheduled for the first half of 2020, is currently delayed.

So far, although stablecoins seem to represent a more stable evolution of virtual currencies, they are not widely used or traded as most of them are still at the design phase or remain only theoretical. As the stablecoin markets develop, tax policymakers may wish to consider giving more attention to the applicable tax rules, and whether these should vary depending on the nature of the stablecoin.

Tax treatment of stablecoins

An important policy consideration is whether virtual currencies in the form of stablecoins should be treated similarly to classic virtual currencies for tax purposes, meaning in most cases that they are considered as an asset and treated as property. Alternatively, should their characteristics in having a more stable value, and in some cases, an asset backing give rise to a different tax treatment, akin to a security or even as a

[29] G20 Finance Ministers and Central Bank Governors' 2019 Press Release on Global Stablecoins available at https://www.mof.go.jp/english/international_policy/convention/g20/g20_191018sc.htm

foreign currency? Although stablecoins provide for an additional level of reassurance against default risks compared to other virtual currencies – making them potentially more reliable for the public, they are not issued by a central bank or a public authority, are not legal tender and therefore it seems unlikely that they would be considered as equivalent to a fiat currency.

Regarding the tax treatment of stablecoins, the limited guidance available suggests that they could be treated in the same way as other virtual currencies. Therefore disposals of stablecoins result in capital gain taxes and any exchange of a stablecoin for a classic virtual currency or for a fiat currency results in a capital gain (or loss) which should be accounted for.

Another treatment has been suggested by the G7 Working Group on Stablecoins, which is to consider treating stablecoins as foreign currencies for tax purposes, or alternatively as securities, with a tax liability linked to the fluctuation in the stablecoin's value relative to the fiat currency to which it is pegged. The taxable event would then occur on the exchange of the stablecoin for fiat currency (G7 Working Group on Stablecoins, 2019[108]).

Relying on the ECJ Hedqvist decision and by analogy with the tax treatment of other virtual currencies, it is likely that the creation of a stablecoin would not trigger a VAT liability. Similarly, the exchange of stablecoins for fiat currencies, for other virtual currencies, or in payment for goods and services would be exempted or outside the scope of VAT.

Overall, there is no international consensus and only very limited country guidance on how stablecoins should be classified for tax purposes. Countries may wish to give consideration to the tax treatment of stablecoins alongside their guidance on the treatment of classic virtual currencies, and in particular consider whether their unique features – such as their stability and potential asset backing – require a different tax treatment.

3.2.2. Central Bank Digital Currencies

Central banks, like governments, may see crypto-assets as posing a potential threat to their monetary policy and money issuance monopoly. Central banks were among the first public institutions that proposed to define and to regulate these assets. According to the University of Cambridge (Cambridge Centre for Alternative Finance, 2019[3]), an analysis of 40 jurisdictions shows that central banks have generally been the first type of public authority to issue a statement on crypto-assets (40%), followed by Ministries of Finance (17%), financial supervisory bodies (17%) and tax administrations (8%). The report also notes that the vast majority of initial statements (75%) were issued in 2013, which corresponds to the year when the market experienced the largest speculative peak since the inception of the first virtual currencies, Bitcoin, in 2009.

Several countries are now considering issuing their own virtual currencies, a movement that has been accelerated by the development of stablecoins. These are referred to as central bank digital currencies (CBDCs). A CBDC, broadly defined by the BIS as "a digital form of central bank money that is different from balances in traditional reserve or settlement accounts", is a digital form of currency that is issued by a central public authority, that would co-exist alongside cash and bank deposits but not replace them (at least in the case of a "retail CBDC" – see below for design considerations). A CBCD would be denominated in the currency of the country it is issued in and would be intended to maintain the same value as its physical counterpart. According to the BIS, CBDCs are considered to be "a new form of money" that would represent a Central Bank liability, denominated in an existing unit of account, serving as a medium of exchange and a store of value (Bank for International Settlements, 2018[117]). A few countries' regulators have also proposed their own definitions. For instance, the Bank of England released a Staff Working Paper where CBDCs are defined as "any electronic, fiat liability of a central bank that can be used to settle payments, or as a store of value" (Bank of England, 2018[118]). Similarly, the Banque de France's CBDC Taskforce issued a document where CBDCs are defined as "an element of the monetary base that is

traded at par against fiat currency and reserves, that only the central bank may issue or destroy, that is available 24/7, that may be used in peer-to-peer transactions and that circulates on digital media that are at least partially different from existing media" (Banque de France, 2020[119]).

While CBDCs might intuitively be associated with crypto-assets such as virtual currencies, fundamental differences exist between CBDCs and other virtual currencies. This difference primarily results from the fact that other virtual currencies cannot be considered to be money or currency, because they do not fulfil the requirements detailed in Section 1.2.5. Even stablecoins, which are backed by a basket of assets, might still be too volatile to perform the functions of money or currency (Schich, 2019[120]). CBDCs on the other hand, which would be issued and backed by a central public authority, such as a central bank, would provide a stable digital form of fiat currency backed by a sovereign authority.

The growing interest in CBDCs is primarily due to the changing nature of money and payments. The use of cash has been steadily decreasing while digital payments have increased significantly. The rapid rise of crypto-assets is an example of this trend – the IMF has looked at the trends and forecasts of cash payments up to 2026, showing that the use of cash is declining and that in turn the relevance of digital means of payments and of CBDCs will continue to increase (IMF, 2019[121]). In this context, a CBDC might provide an alternative, safe and stable payment system that reduces the incentives for private 'money' creation. Moreover, a successful CBDC could significantly increase the speed and efficiency of payments compared to current digital payment options (Bank of England, 2020[122]).

Another reason for the interest in CBDCs is the role they could play in implementing monetary policy. The BIS notes that while a CBDC would not alter the basic mechanics of monetary policy implementation, it could enrich a central bank's monetary policy toolkit. Nevertheless, it is unclear to what extent they would actually increase the efficiency of monetary policy implementation (Bank for International Settlements, 2018[117]).

The extent to which the above mentioned benefits can be realised will depend on the design of the CBDC. There are a wide range of design options that will have to be considered and which will have strong implications for their impact on the monetary and financial system. For example, a CBDC can be based on traditional centralised technology ('account-based') or on DLT ('token-based'). [30] The Bank of England notes that there is no inherent reason why a CDBC should be based on DLT, although using DLT could come with several benefits such as programmability (to self-execute payments) and security (for the user and for the payment infrastructure) (Bank of England, 2020[122]). Another important design option is whether to make the CBDC available to the general public (households and businesses – a "retail CBDC") or limit its distribution to financial institutions and/or post offices (a "wholesale CBDC") (Bank for International Settlements, 2018[117]).

Venezuela was the first country to issue a sovereign virtual currency, the "petro", in 2018. China has announced that it plans to introduce a CBDC that would be issued to commercial banks and financial institutions. A pilot has been underway since April with the largest Chinese financial institutions and municipalities – although details on the CBDC's functioning are not public (The Economist, 2020[123]). CBDC pilots have also been launched or planned in a number of other countries. In January 2020, the ECB and the central banks of Canada, Japan, Sweden, Switzerland and the United Kingdom announced that they will work together with the BIS to explore the issuance of CBDCs in coordination with the FSB (European Central Bank, 2020[124]). In March 2020, the central bank of France issued a call for applications to experiment with a CBDC for interbank settlements. In April 2020, the central bank of Korea announced that it will be conducting a pilot program to assess the technical and legal consequences of introducing a CBDC.

[30] The 'account-based' and 'token-based' systems are often discussed in literature, with divergent interpretation of what they mean – the main difference being about the underlying data structure and the process to transfer funds.

Overall, CBDC projects are still at a very early stage, because central banks are carefully considering the potential disruption of the fractional reserve system and because they consider the current system effective, even though there is a broad recognition that cross-border payments are overly costly (Schich, 2020[125]). However, the increasing interest in CBDCs seems to have been heightened by the discussions, in 2019, on Facebook's Libra Project (see Box 3.1) where governments strongly expressed their concerns and warned against various aspects of such a project including customer protection, money laundering, terrorism financing and data privacy.

CBDCs would most likely differ from stablecoins and other virtual currencies as CBDCs would presumably be fully guaranteed by central banks, similar to national currencies and with the status of legal tender. In these circumstances, countries may wish to consider whether to treat CBDCs similarly to fiat currencies for tax purposes. To date, no country has provided guidance on the tax treatment of CBDCs.

3.2.3. Decentralised finance

Decentralised finance, also known as DeFi is another rapidly evolving aspect of blockchain and virtual currency technology. It can be considered as an alternative financial system based on blockchain and virtual currencies, using applications that aim to provide financial services.

The term DeFi covers the crypto-assets, financial smart contracts, software/protocols and decentralised applications (dApps) used to decentralise and automate financial transactions (CityAM, 2020[126]). Different from the traditional financial system because it is natively digital, DeFi works on decentralised infrastructures and is public and open to all in terms of use, consultation and construction. Today, most DeFi applications exist on the Ethereum blockchain as it is 'historically' where users have most easily developed complex smart contracts. Crypto-assets Ether and DAI are used in these DeFi applications: they are the units of account on most of them (Forbes, 2020[127]).

DApps are developed to create, store and manage digital assets on the blockchain. They are agreements and are enforced by the blockchain network. Some examples of applications are the following:

- A popular and fast growing sector of DeFi is borrowing and lending platforms. Smart contracts connect the lenders to borrowers, enforce the terms of the loans and distribute the return, like 'interest'.[31]
- Other popular types of DeFi application are decentralised exchanges (DEX). DEXes are virtual currency exchanges that use smart contracts to enforce trading rules, execute trades and handle funds – in the form of virtual currencies. Examples of these platforms include AirSwap, DeversiFi, IDEX, Oasis, StellarX, Switcheo Network and TronTrade (Forbes, 2020[128]).
- Payments and remittances to other countries are also facilitated by DeFi applications, which can provide a peer to peer marketplace for payments, with the aim to develop an 'open finance' for unbanked individuals. Some of the popular DeFi payment and remittance platforms include Eveerex, Lightning Network, OmiseGo and Celer Network.
- DeFi allows for some financial instruments that are not seen in the traditional financial sector, for instance the "flash loans" which are a form of loan that must be taken out and paid back within a single transaction and that are used by traders to speculate on market fluctuations (CityAM, 2020[126]).

[31] An area of uncertainty for returns are how these should be categorised. Interest is generally understood as 'the return or compensation for the use or retention by one person of a sum of money belonging to or owed to another' (Her Majesty Revenue and Customs, 2020[149]). Since only few jurisdictions consider virtual currencies to be money, the classification of interest may therefore not be appropriate.

- Other sectors where dApps are growing include insurance, tokenisation of assets, prediction markets, derivatives, margin trading and asset management tools.

Box 3.2. Borrowing and sale virtual currencies

A number of exchanges have recently allowed the borrowing and selling of virtual currencies for a return, commonly called 'interest' (although the definition of interest relates strictly onto on the return on the use of money) (see for example (Finextra, 2020[129]). Under these arrangements, the return, or 'interest rate' for a particular token type is set based on an algorithm which balances the demand for lending and borrowing of that token. This is the case for the USDC tokens, which allow eligible owners to earn interest (called 'rewards') for holding USDC on the Coinbase exchange platform, on a monthly basis and with a variable rate, which Coinbase notes should be reported for US tax purposes (Coinbase, 2020[130]). With the exception of Austria (Bundesministerium, 2020[104]) it is unclear how countries would treat this return for tax purposes, either as income when received, or as an expense when incurred. If the income were to be considered income from a capital asset, and depending on each country's tax laws, it could conceivably be treated in the same way as traditional interest, giving rise to tax as capital income when received and to a deductible loss when paid.

Although DeFi is still a relatively new development, 2020 has been marked by its rapid growth. DeFi Pulse – a website dedicated to analytics and rankings of DeFi protocols – publishes statistics on the monetary value held in DeFi smart contracts. On 4 September 2020, it estimated that USD 8.8 billion are locked in the market – compared to USD 460 million one year before. In terms of volume locked at the time of writing, Uniswap, Maker and Aave dominate across the major applications, with Curve Finance, Yearn. Finance, Synthetix and Compound following behind. USD 1 billion was invested in just three weeks in June 2020 with DeFi platforms now collectively handing out USD25 million per month to their users (Decrypt, 2020[131]).

DeFi supporters argue that it brings about a faster, more affordable, more resilient and transparent financial system making trading more accessible, with lower minimum investments and easy-to-use platforms, without the need for intermediaries and central authorities (Financial Times, 2019[132]). The development of DeFi could potentially help improving financial inclusion globally, which has been among the G20's priorities for over a decade – the G20 Global Partnership for Financial Inclusion (GPFI) is working on financial inclusion and on implementing the 2010 G20 Financial Inclusion Action Plan. However, successful and scalable use cases of DeFi for financial inclusion are still to be developed.

However, fully decentralised applications also raise regulators' concerns over fraudulent transactions and money laundering issues. There have been some recent examples where DeFi has been associated with the 2017-2018 ICO period where a lack of regulation has created instances of rapid boom and bust. An example is the YAM project, with unaudited code, which went from boom to bust within 48 hours (CoinDesk, 2020[133]). In addition, as for other blockchain-based technologies, the DeFi 'industry' suffered several important hacks in 2019 and 2020 resulting in major losses, in addition to the sale of several fake tokens suggesting they were affiliated to well-known dApps.

The tax implications of DeFi have commonly not been addressed by regulators (as also discussed in (PWC, 2020[134])), but a few indications exist in some countries. For instance, in Australia, the ATO publicly answered taxpayers' questions on the tax treatment of DeFi loan applications, stating that each virtual currency is treated as a separate asset and a capital gains tax event happens at the disposal "in any way" of all or part of a holding in a virtual currency. The ATO also indicated that the value of any token received as 'interest' must be declared in tax returns (Australian Taxation Office - ATO Community, 2020[135]).

3.2.4. Increasing use of proof of stake consensus mechanisms

In addition to the development of stablecoins and CBDCs, there are a number of other changes in the nature and technologies associated with virtual currencies that give rise to new and relatively unconsidered tax issues. These include changes in the dominant consensus mechanism and in the use of tokens as collateral for borrowing and lending.

The move from proof of work to proof of stake and other consensus mechanisms may suggest additional consideration from policymakers. Most countries' guidance was created with a specific form of virtual currency in mind (i.e. Bitcoin) and in many cases, the treatment of mining rewards as non-taxable events for income or VAT purposes is predicated on the fact that there is no obvious relationship or exchange for consideration between the payer of the token and the miner undertaking the transaction. Proof of stake challenges this treatment as it relies on individuals' existing holdings of tokens in order to generate the reward once the individual validates a blockchain operation, although the individuals or their agents must carry out an action in order to generate the reward. The linkage to existing holdings raises the possibility that the return is more akin to a return on the assets held by the individual, and therefore closer in concept to investment income, although the fact that action is required may alternatively support treatment similar to mining rewards.

Proof of work protocols were the initial consensus mechanisms adopted for virtual currencies and are still the most commonly used. For example, Bitcoin, which accounts for nearly two-thirds of virtual currencies by value, uses a proof of work mechanism. However, as the nature of virtual currencies continues to evolve, new tokens are being created using proof of stake mechanisms and existing tokens using proof of work tools are considering a change. Ethereum, the second largest virtual currency by value, is planning to switch to a proof of stake mechanism under Ethereum 2.0 in the second half of 2020.

From a tax perspective, the increased use of proof of stake consensus mechanisms rather than proof of work mechanisms may suggest that countries could reassess whether their guidance is appropriate. Most of the guidance available as at the time of writing this report was prepared in a context where virtual currencies were almost exclusively created by mining. The impact of this is particularly clear in the VAT area, where the approach adopted in many countries to the receipt of new tokens relies on the fact that there is no direct relationship between a miner with any other party that gives rise to the unit of virtual currency, and thus no supply for VAT purposes. Similarly, the approach to the VAT treatment of virtual currencies in EU countries has been determined by the Hedqvist decision, which explicitly considered Bitcoin. Given that the underlying mechanisms differ significantly between proof of work and proof of stake (and other consensus mechanisms), a treatment developed based on the characteristics of the proof of work may not be appropriate under other mechanisms.

A key difference between proof of work and proof of stake protocols for tax purposes is the connection of the miner (or forger) with the network. As indicated, under a proof of work protocol, a miner does not necessarily need to be an owner of the type of token it is mining: the reward from processing transactions in the shape of new tokens is generated by an automatic system, accompanied in some cases via a transaction fee offered by the transactors to incentivise faster processing. This arrangement means that there is no obvious connection or agreement between the miner and any other party to the transaction, nor any link between the income received and the miner's prior holdings of the virtual currency in question. Proof of stake protocols change these assumptions, as forgers can only receive tokens or transaction fees in respect of their prior holdings of the same virtual currency type and in proportion to their share of the virtual currency's base, although forgers or their agents must take affirmative action in order to receive tokens or fees.. From a tax perspective, this raises the possibility of treating the forger as generating a return on its underlying assets. It may also give rise to a question of whether this results in 'dilution', as suggested by (Landoni, M. and Sutherland, A., 2020[136]), where they argue that the return received by a staker may be partially offset by a reduction in the value of the other tokens they hold, with potential tax

implications if the gains are taxed on receipt rather than disposal.[32] Similar issues may arise with respect to mining.

Two countries have issued guidance on the receipt of new tokens from forging, differentiating this from the tax treatment of new tokens received via mining. In Finland, income from forging is considered to be a return on existing assets (i.e. the previously owned virtual currencies) and the income is treated as capital income at the time that the holder acquires control of the new currency, whereas income from new tokens received via mining is treated as income other than income from capital (Veroskatt, Finnish Tax Administration, 2020[56]). In Australia, new tokens received via forging are treated as ordinary income when the new tokens are received, whereas the tax treatment of tokens received via mining are taxed for the first time on disposal if the taxpayer is not mining in the course of business (Australian Tax Office, 2019[137]).

Proof of stake is significantly less energy-intensive than proof of work, given the greater computing power required to solve the mathematical puzzle and add the transaction to the blockchain. Box 7 provides further information on the energy use associated with proof-of-work mechanisms. Consideration could also be given to whether the tax treatment may affect the choice of protocol used or the number of transactions in each system, as well as to the associated environmental impacts.

[32] (Sutherland, 2019) discusses this argument further. The issue of dilution was also recently raised in a letter from four members of the United States' Congress to the US Internal Revenue Service: https://schweikert.house.gov/sites/schweikert.house.gov/files/Final%20Proof%20of%20Stake%20IRS%20Letter%207.29.20.pdf .

Box 3.3. Energy consumption of virtual currencies

Virtual currencies ensure trust through a "consensus mechanism". In the case of bitcoin, consensus is achieved by a method called "proof-of-work", where computers on the network – "miners" – compete with each other to solve a complex mathematical puzzle. Each guess a miner makes at the solution is known as a "hash," while the number of guesses taken by the miner each second is known as its "hashrate." Once the puzzle is solved, the latest "block" of transactions is approved and added to the "chain" of transactions. The first miner to solve the puzzle is rewarded with new bitcoins and network transaction fees. The energy use of the bitcoin network is therefore both a security feature and a side effect of relying on the ever-increasing computing power of competing miners to validate transactions through proof-of-work.

The energy use of the bitcoin network is a function of a few interrelated factors, some of which respond to changes in bitcoin price (IEA (International Energy Agency), 2020[138]): a) mining hardware specifications, notably power consumption and hashrate; b) network hashrate, the combined rate at which all miners on the network are simultaneously guessing solutions to the puzzle; c) "difficulty" of solving the puzzle, which is adjusted in response to the network hashrate to maintain the target block rate of one block every 10 minutes; and d) energy consumption by non-IT infrastructure, such as cooling and lighting.

The rising price of bitcoin has driven huge increases in hashrate and difficulty, along with the development and deployment of more powerful and energy efficient mining hardware. The IT infrastructure for bitcoin and other virtual currencies has evolved rapidly over the past decade. The latest purpose-built hardware used to mine bitcoin – application-specific integrated circuits (ASICs) – are both more powerful and more energy efficient – around 50 million times faster (hashes per second, H/s) and a million times more energy efficient (hashes per joule, H/J) in mining bitcoin than the CPUs used in 2009 (IEA (International Energy Agency), 2020[138]). The bitcoin network consumed around 60 TWh in 2019, or about 0.25% of global electricity use (CCAF (Cambridge Centre for Alternative Finance), 2020[139]).

Due to differences in design, Ethereum, the second-largest virtual currency by market value, processes more than twice as many transactions as the bitcoin network while using less than one-third of the electricity consumed by bitcoin (Gallersdörfer, Klaaßen and Stoll, 2020[140]) (Krause and Tolaymat, 2018[141]). Ethereum also operates on a proof-of-work consensus mechanism, but is moving towards proof-of-stake in an effort to reduce its energy intensity. Proof-of-stake and proof-of-authority could help to reduce energy use while also addressing scalability and latency issues.

Source: IEA (International Energy Agency).

4 Conclusions and considerations for policymakers

Virtual currencies are a rapidly evolving form of crypto-asset that pose a number of challenges for tax policy. These challenges arise from a number of factors due to the nature of these assets, including their lack of centralised control, (pseudo-)anonymity, valuation difficulties, hybrid characteristics (i.e. including both aspects of financial instruments and intangible assets). Other challenges arise from the rapid evolution of the underpinning technology and of virtual currencies themselves, including recent developments in the rise of stablecoins and central bank digital currencies (CBDCs).

This report has drawn on questionnaire responses and guidance documents from over 50 jurisdictions to analyse the current tax treatment of virtual currencies, under income taxes, VAT and property taxes, as well as a range of emerging tax issues.

From this analysis, it appears clear that the taxation of virtual currencies requires policymakers to balance a number of competing goals and perspectives. While this report does not make recommendations, it does provide a number of general insights that policymakers may wish to consider in the taxation of virtual currencies:

- **Policymakers may wish to ensure that their country has clear guidance and a clear legislative framework:**
  - **Policymakers may consider providing guidance on how virtual currencies fit within the existing tax framework.** Even if covered under existing laws on the taxation of property assets or capital gains, at a minimum, guidance on how virtual currencies fit within the existing tax framework may be useful, in order to promote clarity and certainty for taxpayers. If existing laws are unclear or not adapted to virtual currencies given their special characteristics (e.g. price volatility, hybrid nature, type and number of transactions, creation protocols) then governments may wish to consider issuing specific guidance. In some cases amendments to existing regulatory provisions, or even specific regulation for these assets, may be useful to ensure the legislative framework is also clear. Similarly, providing a definition of virtual currencies for tax purposes may be helpful.
  - **Policymakers may consider providing guidance that is comprehensive and addresses the major taxable events and income forms associated with virtual currencies.** In particular, the tax consequences of a number of key concepts may be particularly important to cover under income taxes, VAT and property or transfer taxes, in order to provide clarity to taxpayers. These include:
    - Creation of virtual currencies (via mining/forging, ITOs and airdrops) and related expenses;
    - Exchange with other virtual currencies, fiat currency, and for goods and services including valuation;
    - Disposal via gift or inheritance;
    - Loss or theft;
    - Emerging developments (hard forks, stablecoins, CBDCs, interest-bearing tokens);

  - Related services (e.g. exchange services and wallets).
  - **More broadly, guidance could also usefully indicate how other forms of crypto-assets (including security and utility tokens) are to be treated for tax purposes**. At present, most country guidance relates to virtual currencies and the tax treatment of other forms of crypto-assets is less established. Official guidance on the boundaries between different types of crypto-assets, and on how other forms of these assets are treated for tax purposes, could be useful.
  - **There may be value in reviewing and adapting guidance frequently.** In such a fast-paced area, there may be value in regularly reviewing guidance to ensure that it remains relevant in the face of technological and market developments related to virtual currencies and other emerging asset-types. It may also be helpful to take stock of approaches adopted in other countries and any emerging international trends.

- **Policymakers may wish to communicate the rationale behind the adopted tax treatment.** Given the fast changing nature of these assets, stating the rationale behind the classification adopted for tax purposes could enable the tax treatment to be more transparent and more flexible should a new form of virtual currency emerge.
- **Policymakers may wish to consider whether the tax treatment of virtual currencies should be consistent with the tax treatment of other assets.** Once the treatment of virtual currencies is defined, consistency with the tax treatment of other assets of the same type could enhance tax system neutrality, unless there is a reason to deviate from it due to the specific characteristics of virtual currencies. For VAT in particular, the VAT treatment would ideally be consistent with the treatment of traditional payment instruments and other financial assets in that jurisdiction. While exchanges are often exempt or outside the scope of VAT in most countries, there is less consistency and clarity on the treatment of mining or other types of services, which could be reviewed against the broader VAT framework for payment instruments.
- **Policymakers may wish to consider whether the tax treatment of virtual currencies is coherent with the broader regulatory framework.** Tax policy should ideally exist inside a sound regulatory framework for virtual currencies and other crypto-assets, and to be coherent with other policy aspects including tax transparency and legal, financial and consumer protection requirements.
- **Policymakers may wish to consider how to support improved compliance**: A particular point of difficulty in complying with tax rules for virtual currencies arises from their fast moving values, differing exchange rates for the same virtual currency, the lack of obvious translation into fiat currency in some cases, and the need to keep complex records of monetary flows and transaction dates. It is also a challenge for tax administrations to obtain reliable and timely information on these transactions and whether a more prominent role could be given to intermediaries in providing tax administrations with this information. Measures to reduce the need for valuations, for example, via pooling rules, as well as ensuring that exchanges are not treated as barter events under VAT rules, could be considered to facilitate compliance, particularly by smaller taxpayers. Similarly, excluding exchanges between different types of virtual currencies from income tax consequences may also ease compliance requirements, while still ensuring that gains are taxed when tokens are converted into fiat currency or used to purchase goods and services. However, in making any simplifications to these rules to promote compliance, governments would also need to balance tax planning risks that could be created by these changes.
- **Consideration could be given to providing simplified tax treatment for occasional or small traders.** Virtual currencies are used by a number of individuals who do not pursue the activity in a business capacity and may earn only limited amounts of non-employment income. For this group of individuals, tax systems could consider practical settings to encourage compliance, including de minimis exemptions for personal use (e.g. by volume, trade or gain value). Similarly, governments

could consider whether a simplified regime could be appropriate for small trades or purchases, to avoid capital gains tax consequences each time a transaction is completed; e.g. by taxing individuals on a basis more similar to foreign currency or by providing for a restricted personal use exemption for small transactions.

- **Policymakers may wish to consider how the tax treatment of virtual currencies could align with or undermine other policy objectives.** For instance, given the decline in cash use, some governments are considering how best to support cashless or electronic payments, including by the development of CBDCs. This process may accelerate as countries navigate the COVID-19 crisis. Similarly, consideration could be given to whether the tax treatment of virtual currencies is consistent with countries' environmental policy objectives. As the commonly-used proof of work consensus mechanism requires large amounts of computing power this can have environmental consequences, particularly in jurisdictions where electricity is primarily derived from coal or other fossil fuels. The tax treatment of the electricity costs associated with mining and of the proof of stake consensus mechanism, which requires considerably lower electricity use can therefore affect environmental consequences, particularly if the costs of pollution are not reflected in prices.

The report has also reviewed a number of emerging developments in the field of virtual currencies which have not yet been widely considered by tax policymakers. Moving forward, policymakers may wish to pay particular attention to the tax treatment of these areas, especially where there may be a need for separate or updated guidance. These emerging areas include:

- **The tax treatment of new assets received when a hard fork occurs has only been addressed by a handful of countries.** In considering the tax treatment of hard forks, a key question to answer is when the taxpayer is deemed to receive the assets for tax purposes. It may be more appropriate to tax these assets when the taxpayer exercises dominion over the assets, or even at first disposal, against a basis of zero. If a taxable event is occasioned on receipt of the new tokens, consideration may need to be given as to how taxpayers can address liquidity concerns, regarding situations where the taxpayer is unable to access the asset, and as to how losses are to be treated if the value of the new asset falls after it is received and taxed.
- **Stablecoins & Central Bank Digital Currencies (CBDCs) represent new forms of virtual currencies.** These new asset types have unique characteristics that tax policymakers may wish to consider further and more specifically. Rather than applying existing virtual currency guidance, policymakers may wish to consider the specific characteristics of CBDCs and stablecoins (e.g. the fact that they are backed in many cases by other assets, or fiat currencies, and in the case of CBDCs, by central banks) and consider whether the existing rules are appropriate. How they are treated for tax purposes may depend on their characteristics e.g.it may be possible to consider whether or not treating them as fiat currency (in the case of CBDCs) or securities (in the case of stablecoins) could be appropriate for tax purposes.
- **Other new token types and characteristics are also emerging.** Token types evolve rapidly and almost no countries have issued guidance on the tax treatment of emerging characteristics in the market, such as tokens generated by proof of stake protocols, or the use of virtual currencies as an interest bearing asset, which may bring them closer to security tokens in nature. Although similar to virtual currencies in nature, these assets share characteristics with traditional capital or financial assets that generate a return and are less similar to assets which appreciate over time: therefore consideration could be given to whether a tax treatment akin to capital income is more appropriate than capital gains income. Considering and addressing these asset types in tax guidance may be helpful to provide certainty for taxpayers and to prevent tax planning opportunities.

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Taxing Virtual Currencies

An Overview of Tax Treatments and Emerging Tax Policy Issues

Crypto-assets, and virtual currencies in particular, are in rapid development and tax policymakers are still at an early stage in considering their implications. G20 Leaders and Finance Ministers have called international organisations to analyse the risks posed by crypto-assets. So far, the tax policy and evasion implications have been largely unexplored, although forming an important aspect of the overall regulatory framework. Prepared with the participation of over 50 jurisdictions, *Taxing Virtual Currencies* is the first comprehensive analysis of the approaches and policy gaps across the main tax types (income, consumption and property taxes) for such a large group of countries. This report also considers the tax implications of a number of emerging issues, including the growing interest in stablecoins and 'central bank digital currencies'; as well the evolution of the consensus mechanisms used to maintain blockchain networks and the dawn of decentralised finance. This report was prepared for presentation to the October 2020 meeting of G20 Finance Ministers and Central Bank Governors. It provides key insights and a number of considerations to help policymakers wishing to improve their tax policy frameworks for virtual currencies.



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