VAT ON CRYPTOCURRENCIES

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SimpleTax

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I am an attorney and a tax advisor in the Czech Republic, EU. My main areas of interest are law and finance, while I like to divide and then join them together when needed. My specialization is in the taxation of digital businesses and tax litigation. See my CV on LinkedIn.

Introduction

As part of my work with clients, I have encountered the problem of taxing cryptocurrencies already a few years earlier. I am a crypto holder and trader myself. After the huge boom in the value of virtual currencies last year (2017), I increasingly see the national tax authorities becoming interested in the same issue.

Cryptocurrencies and the EU VAT is a recent topic and undeveloped both in literature and doctrine. The Hedqvist[1] case regarding the nature of Bitcoin transactions and the exchange services is well known. But nowadays, in the year 2018, there are more than 1600[2] cryptocurrencies, ongoing ICOs, hence not all the conclusions from the Hedqvist case are still relevant. To be clear, in this work the word cryptocurrency is used interchangeably to the definition of virtual currency as specified in the fifth anti-money laundering directive[3].

1 *Hedqvist* CJEU C-264/14.

2 'Cryptocurrency Market Capitalizations | CoinMarketCap' <https://coinmarketcap.com/> accessed 6 June 2018.

3 'Texts Adopted - Thursday, 19 April 2018 - Prevention of the Use of the Financial System for the Purposes of Money Laundering or Terrorist Financing ***I - P8_TA-PROV(2018)0178' <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P8-TA-2018-0178&format=XML&language=EN#BKMD-6> accessed 10 June 2018. 'Virtual currencies' means a digital representation of value that is not issued or guaranteed by a central bank or a public authority, is not necessarily attached to a legally established currency and does not possess a legal status of currency or money, but is accepted by natural or legal persons as a means of exchange and which can be transferred, stored and traded electronically.

This e-book is based on the final diploma thesis I defended at Tilburg University, the Netherlands. I have previously published two articles[4,5] related to the topic of taxation of cryptocurrencies and I continue in the development of the conclusions in this work. But this is only the start. I believe it is much more to come.

The work starts with establishing benchmarks as for the VAT on general services. Basic concepts of consumption, supply for consideration, taxable persons or financial services are discussed. As for the methodology of this part, a preliminary analysis is performed, then the description and analysis of the statutory provisions and doctrinal research. The literature relevant to the topic of VAT is broad, starting with coursebooks such as European Tax Law[6], the commentary to the VAT directive[7]. The analysis of the related case law is included.

The VAT aspects of exchange of cryptocurrencies follow, including alternative cryptocurrencies and a case study of the functioning of the Local Bitcoins. The research question which should be answered in this part is if Article 135(1)(e) of Directive 2006/112 must be interpreted as meaning that the supply of exchange services of traditional currencies for units of the cryptocurrency and vice versa, performed in return for payment of a sum equal to the difference between, are transactions exempt from VAT?

The next chapter examines mining of cryptocurrencies. A particular attention is paid to mining pools. The aim of this part is to answer the question, whether are cryptocurrency mining activities generally outside the scope of VAT? If the mining of cryptocurrencies may be treated as an economic activity, the question

4 Michal Hanych, 'Taxation of Cryptocurrencies' 2018 eBulletin of the Czech Chamber of Tax Advisers.

5 Michal Hanych, 'VAT Treatment of Tokens and Mining' 2018 eBulletin of the Czech Chamber of Tax Advisers.

6 Ben Terra and Julia Kajus, *Introduction to European VAT (Recast)* (IBFD 2017).

7 Ben Terra and Julia Kajus, *Guide to the Recast VAT Directive*, vol 2017 (IBFD).

follows, if the Article 135(1)(d) of Directive 2006/112 must be interpreted as meaning the provision of services in connection with the verification of specific transactions for which specific charges are made, it will be exempt due to falling within the definition of 'transactions, including negotiation, concerning deposit and current accounts, payments, transfers, debts, cheques and other negotiable instruments?

The fourth part of the work is devoted to tokens and ICOs. The first question arises, whether ICO tokens as a form of cryptocurrencies are outside the scope of VAT? And if the tokens are within the scope of VAT, how to tax the different types of tokens?

My work is limited only to the VAT aspects of cryptocurrencies, although there are several related issues such as technical aspects of blockchain technology, the tax treatment of the obtained income, anti-money laundering rules or obligations, and enforceability in connection with smart contracts.

The lessons learned from the previous sections are incorporated into the regulatory recommendations. I try to handle recommendations in three areas: cryptocurrency exchanges, mining of cryptocurrencies and ICOs.

I am open to any remarks or suggestions for improvements. You can reach me on my e-mail hanych@simpletax.cz

1 VAT on Services – Establishing Benchmarks

1.1 Introduction

The purpose of this chapter is to establish benchmarks. Also, it is necessary to define the basic concepts and to indicate the relevant case law of the CJEU. These benchmarks are then further used in this work to draw conclusions in the application of VAT in connection with cryptocurrencies.

It starts with consumption, which immediately raises the question of whether we can talk about consumption at all in connection with cryptocurrencies. Another important concept is the consideration and the link between it and the service provided. Especially in the case of cryptocurrency mining, there may be not sufficient link between activity and remuneration, as the remuneration is largely based on chance. It makes sense to deal with the notion of a taxable person, since many entities operating in the context of cryptocurrencies behave like that VAT do not even concern them.

This is followed by a brief introduction to the determination of place of supply and supply of electronic services. Very close to the nature of cryptocurrencies are financial services. For this reason, it is analyzed how they are actually defined and how they are treated in terms of VAT. How to handle mixed and composite supplies? In the case of cryptocurrencies, we often encounter tokens that include the aspect of means of payment, service and security.

1.2 Concept of Consumption

The VAT is defined as a general indirect tax on consumption[8]. The objective of such taxation is to tax consumption, by which meaning the expenditures made by private persons[9]. There is an obvious difference between the consumption

8 Terra and Kajus (n 6). p. 147.

9 Ibid.

and the payment for supply. In reality, the EU VAT system is not really built on the relevance of the factual consumption. The chargeable event takes place when the goods or the services are supplied[10]. If the payment is made before the goods or services are supplied, VAT is chargeable at that moment[11]. Therefore the consumption is only presumed by the event of spending and the fact whether there is any real consumption or none, is not relevant. It may be observed in practice, similarly the general rule of the taxation of private persons consumption need not apply in many cases. The expenditures of states and local governments are taxed[12] as well as the expenditures of small entities, which are exempted taxable persons due to their low turnover[13]. Under the EU VAT system all the persons providing supplies without the right of deduction system are effectively taxed on their expenses, even though they are conducting economical activities and are not in fact private persons[14].

The concept of fiscal neutrality is closely connected to the taxation of consumption. The EU VAT system achieves the taxation of consumption indirectly via the credit invoice system, granting the right of deduction to the taxable person of an amount of the VAT due or paid in respect to goods or services supplied to the taxable person[15]. Practitioners are always concerned with the question of the right of deduction. *The deduction system is meant to relieve the trader entirely of the burden of the VAT payable or paid in the course of all his economic activities. The common system of VAT consequently ensures complete neutrality of taxation of all economic activities, whatever their purpose or results,*

10 Art. 63 of the Council Directive 2006/112/EC of 28 November 2006 on the common system of value added tax (the "Directive" or "VATD").

11 Art. 65 VATD.

12 Art. 13 VATD.

13 Art. 285 - 288 VATD.

14 Article 132, i.e. postal services, hospital and medical care, education.

15 Art. 168 VATD.

provided that they are themselves subject in principle to VAT[16]. But the neutrality is a polysemy, whereas it should be distinguished between neutrality in the internal sense of a specific country and neutrality in external sense of international aspects or relations. Likewise in both categories a distinction can be made betweeen legal, economic and competition neutrality[17]. As it may be expected, there are exceptions to every principle, including neutrality. Primarily, a taxable person is not entitled to deduct input VAT where the transactions from which that right derives constitutes an abusive practice[18]. If, it is ascertained, as having regard to objective factors, that the supply is to a taxable person who knew, or should have known that, he was participating in a transaction connected with fraudulent evasion of value added tax, it is the reason to refuse that taxable person entitlement to the right to deduct the input VAT[19].

We may approach consumption from two different perspectives. The first one is the perspective of the individual making an expenditure. The second one may be based on total consumption in a country[20]. Under the second approach, a consumption occurs only if an individual *uses real resources from the pool available to all participants in the economy.* We are standing on the edge of a new era, where the digital products may be delivered in huge amounts without any additional significant costs or use of resources. Thus we ask, do we really consume data if the information stored does not disappear? Similar questions arise when the taxation of financial services is discussed. By granting a loan with interest there is no possibility of consumption of the money. Therefore we feel it is not appropriate to burden financial transactions by VAT.

16 *Halifax* CJEU C-255/02., para 78

17 For closer information see ibid Terra - Introduction to EVAT

18 *Halifax* (n 16). para 99.

19 *Axel Kittel* CJEU C-439/04.

20 Robert van Brederode and Richard Krever, 'Theories of Consumption and the Consequences of Partial Taxation of Financial Services', *VAT and Financial Services: Comparative Law and Economic Perspectives* (2017).p. 5.

The preliminary sight suggests cryptocurrencies also cannot be consumed. The blockchain is immutable and all the transactions are based on consensus between participants[21]. A cryptocurrency cannot disappear from a blockchain ledger, because it is the ledger itself. As was mentioned before, the concept of VAT is not in fact based on consumption, but on the event of spending presuming the further consumption. The reality is even more complicated. We think about the bitcoin as a cryptocurrency in general by which services or goods may be purchased in exchange. Bitcoin coins are created by mining[22], but there are more than sixteen hundred (and counting) various cryptocurrencies often with miscellaneous ways of their creation. Mining is not the only way how to obtain a new cryptocurrency. New types of cryptocurrencies are created by forks. That means, even the sole possession of a cryptocurrency constitutes a new one type, keeping both old and new[23]. One of the alternatives to the *proof of work* concept which is used by Bitcoin mining, is the *proof of burn*[24]. The principle is to destroy one cryptocurrency, i.e. one unit of bitcoin, and to obtain an alternative cryptocurrency, i.e. slimcoin[25]. The cryptocurrency is naturally not destroyed physically, but by sending it to an unspendable address and which cannot be used anymore. The rationale behind is to derive the value of an alternative cryptocurrency from the one which is burnt. A regular currency

21 Imran Bashir, *Mastering Blockchain: Deeper Insights into Decentralization, Cryptography, Bitcoin, and Popular Blockchain Frameworks* (Packt Publishing - ebooks Account 2017). p. 210

22 Ibid. p. 256.

23 Phil Glazer, 'An Explanation of Cryptocurrency Forks' (*Hacker Noon*, 11 February 2018) <https://hackernoon.com/an-explanation-of-cryptocurrency-forks-65d79efe214c> accessed 15 June 2018.

24 Ibid. p. 258.

25 Slimcoin whitepaper in *Slimcoin: SLIMCoin Official Repository* (The Slimcoin Project 2018) <https://github.com/slimcoin-project/Slimcoin> accessed 6 June 2018. For further details see 'Proof of Burn - Bitcoin Wiki' <https://en.bitcoin.it/wiki/Proof_of_burn> accessed 6 June 2018.

cannot achieve anything like this. It is inconceivable to destroy a dollar banknote and get an euro one in return. In this sense some cryptocurrencies *may* be consumed, not only exchanged.

The consideration[26] is crucial. If there is not present any consumption, but a payment is made, some additional contradictions between what it may be felt as consumption and what is actually within the scope of VAT may occur.

1.3 Supply of Services for Consideration

Supply of services is defined as any transaction which is not a supply of goods[27], whereas a supply of goods means the transfer of the right to dispose of tangible property as owner[28]. Hence in case of cryptocurrencies, which are definitely intangible, and with respect to the exception of Article 15 VAT Directive[29], we shall only consider supply of services. More specifically, supply of services for consideration within the territory of a Member State by a taxable person is subject to VAT according to the Article 2 (1) VAT Directive. Although a service is provided for consideration, it may be further discussed, whether the service is rendered within the scope of VAT directive. For instance, illegal transactions fall outside the scope of the VAT system. Importation and sale of drugs[30,31] or counterfeit currency[32] are also outside the scope. On the other hand, operating a

26 Article 2(1) of the VAT Directive requires supplies of goods and services to be effected "for consideration".

27 Art. 24 VATD.

28 Art. 14 VATD.

29 Electricity, gas, heat or cooling energy and the like shall be treated as tangible property.

30 *Einberger I* CJEU C-240/81.

31 *Happy Family* CJEU C-461/12.

32 *Witzemann* CJEU C-343/89.

roulette without official authorization[33] does not lead to the conclusion of a service provided outside the scope of VAT, because there is *nothing to prevent levies of the same kind as those payable by licensed casinos from also being imposed on organizers of unlawful games of chance*[34]. The distinguishing criterion in this regard, is whether the service is provided under objective circumstances as *extra commercium*. A notorious website in connection with cryptocurrencies is the infamous Silk Road, offering drugs, weapons and even assassinations[35]. Payments for services were made in bitcoin, the website was hidden under the Tor network[36] and the operator was eventually captured and convicted[37].

The next question that arises is whether a non-remunerated service can also be subject to VAT. The direct link between the service and the benefit was not found in the case Coöperatieve Aardappelenbewaarplaats[38]. The owners of share certificates had right to put in store each year 1000 kilograms of potatoes for each share certificate. A provision of services for which no definite subjective consideration is received does not constitute a provision of services.

We consider the case of Mr. Tolsma[39] who played a organ on the public highway in the Netherlands. During his musical performance he offered passers-by a collecting tin for their donations; he also sometimes knocked on the door of

33 *Fisher* CJEU C-283/95.

34 Terra and Kajus (n 6). p. 176.

35 Jeremy Martin, *The Beginner's Guide to The Internet Underground* (2015) <https://s3.amazonaws.com/storage.pardot.com/12882/90732/The_Beginners_Guide_to_The_Internet_Underground.pdf>.

36 The Tor Project Inc, 'Tor Project | Privacy Online' <https://www.torproject.org/> accessed 9 June 2018.

37 Benjamin Weiser, 'Man behind Silk Road Website Is Convicted on All Counts' [2015] New York Times <https://www.nytimes.com/2015/02/05/nyregion/man-behind-silk-road-website-is-convicted-on-all-counts.html>.

38 *Coöperatieve Aardappelenbewaarplaats* CJEU C-154/80.

39 *Tolsma* CJEU C-16/93.

houses and shops to ask for donations, however unable to claim any remuneration by right. The court followed that a supply of services is effected "for consideration", only if there is a legal relationship between the provider of the service and the recipient pursuant to which there is reciprocal performance, the remuneration received by the provider of the service constituting the value actually given in return for the service supplied to the recipient. But in presented case there was no legal agreement between parties, since the donations were made on voluntary basis. Secondly, there was no necessary link between the musical service and the payments, as the passers-by did not request music to be played. Moreover, the donation was dependent not on the musical service, but on subjective motives. Naturally some people contributed a considerable sum, while others listened to the music without making any donation at all. The court concluded the services were not supply of services affected for consideration, because an activity consisting in playing music on the public highway, for which no remuneration is stipulated, even if the musician solicits money and receives sums whose amount is however neither quantified nor quantifiable. This interpretation is not affected the fact that a musician such as Mr. Tolsma solicits money and can in fact expect to receive money by playing music on the public highway. *The payments were entirely voluntary and uncertain and the amount was practically impossible to determine*[40].

Mr. Tolsma was collecting small amounts of notations. Does the situation change, if a service is provided to a greater extent? The Hong Kong Trade Development Council[41], was established as a trade organization with an aim of promotion trade between Hong Kong and other countries. The Hong Kong Trade Development Council provided information and advice about the country free of charge. The cost of this activity was financed partly by a grant from the Hong Kong government and partly from a levy on products imported into and exported from Hong Kong. Again, the court concluded that from the scope of VAT is excluded any person who habitually *provides services free of charge*, since

40 ibid. para 19.

41 *Hong Kong Trade* CJEU C-89/81.

services provided free of charge are different in character from taxable transactions which, within the framework of the value added tax system, presuppose the stipulation of a price or consideration[42].

Next we may ask, what if the situation is opposite, if there is a consideration received without any relevant activity? Transactions free of charge are outside the scope of VAT, as there is no consideration provided[43]. Similarly, the lack of transactions causes these services to fall outside the scope of VAT, such as in the Polysar case[44]. Polysar was a pure holding company, without direct or indirect involvement in the management of the companies in which the holding has been acquired[45]. Even joining a partnership for consideration is not connected with taxable transaction[46]. The taking of shares does not in itself constitute an economic activity, the same must be true of activities consisting, in the transfer of such shares[47]. *The admission of a new partner into a partnership does not therefore constitute a supply of services to him*[48], even if a consideration is paid for the admission.

Apple and Pear Development Council[49] was established to advertise and promote apples and pears grown in England and Wales. The Development Council was entitled to impose on growers a mandatory annual charge. There was no relation between the level of benefits received and the amount of mandatory charges, as the charges were based on area planted. Similarly, public broadcasting activities funded by a compulsory statutory charge paid by owners

42 Terra and Kajus (n 6). p. 183.

43 For further details see ibid. p. 184.

44 *Polysar* CJEU C-60/90.

45 ibid. para 17.

46 *KapHag* CJEU C-442/01.

47 *Wellcome Trust* CJEU C-155/94. para. 33.

48 *KapHag* (n 46). para 41.

49 *Apple and Pear Development Council* ECJ 102/86.

or possessors of a radio receiver and carried out by a radio broadcasting company created by law, do not constitute a supply of services 'effected for consideration' within the meaning of that provision and therefore fall outside the scope of the directive[50]. On the other hand, even if the healthcare provided to clients of residential care homes for the elderly is neither defined in advance nor personalized and that the payment is made in the form of a lump sum is also not such as to affect the direct link between the supply of services made and the consideration received, the amount of which is determined in advance is done on the basis of well-established criteria[51]. The court referred to the previous conclusion regarding payment for services which are not defined in advance nor personalized, such as an annual subscription fees of the members of a sports association can constitute the consideration for the services provided by the association, even though members who do not use or do not regularly use the association's facilities must still pay their annual subscription fees[52].

To sum up, the uncertain nature of the provision of any payment leads to a breach of the direct link between the service provided and the payment. In the case of horse racing, the treatment of prize money is without any surprise outside the scope of VAT, because of the insufficient link between the activity and prize money received[53]. *On the other hand, such a supply of a horse for the purposes of its participation in the race constitutes a supply of services for consideration where it gives rise to the payment, by the organiser, of remuneration irrespective of whether or not the horse in question is placed in the race.* What is interesting, is the conclusion of the court with regard to the input VAT deduction. *A person who breeds and trains his own race horses and those of other owners, has the right to deduct input VAT on the transactions relating to the preparation for horse races of his own horses and the participation of his own horses in races, on the ground that the costs pertaining to those transactions are part of the general costs linked to his economic*

50 *Český rozhlas* CJEU C-11/15.

51 *Le Rayon d'Or* CJEU C-151/13. para 37.

52 *Kennemer Golf* CJEU C-174/00.

53 *Baštová* CJEU C-432/15. para 40.

activity, provided that the costs incurred in each of those transactions have a direct and immediate link with that overall activity. That may be the case if the costs thus incurred pertain to race horses actually intended for sale or if the participation of those horses in races is, from an objective point of view, a means of promoting the economic activity, this being a matter for the referring court to determine. In other words, even if the taxable person receives a remuneration based on random event, the right to deduct input VAT remains preserved if the general costs are linked to economic activity[54]. The chance of victory of a horse in the race is considerably higher than a chance of cryptocurrency miner to be the one who receives the block.

In the case of using cryptocurrencies to express the value of a trade instead of a traditional currency, another problem occurs in the conversion to fiat-currency. The VAT directive contains provisions how to calculate the value[55] expressed in a foreign currency. For services, *the exchange rate applicable shall be the latest selling rate recorded, at the time VAT becomes chargeable, on the most representative exchange market or markets of the Member State concerned, or a rate determined by reference to that or those markets, in accordance with the rules laid down by that Member State. Member States shall accept instead the use of the latest exchange rate published by the European Central Bank at the time the tax becomes chargeable. Conversion between currencies other than the euro shall be made by using the euro exchange rate of each currency. Member States may require that they be notified of the exercise of this option by the taxable person*. This provision is, however, not applicable in the case of cryptocurrencies, since they are not currency within the meaning of the Directive. *The taxable amount shall include everything which constitutes consideration obtained or to be obtained by the supplier, in return for the supply, from the customer or a third party, including subsidies directly linked to the price of the supply*[56]. Although is clear the taxable amount should include everything which constitutes consideration obtained, the problem of how to valuate the

54 ibid; para. 46 and *Becker* CJEU C-104/12.

55 A 91 VATD.

56 A 73 VATD.

consideration remains. The author of this work suggests using the open market value as defined in Article 72 of the Directive, which *shall mean the full amount that, in order to obtain the services in question at that time, a customer at the same marketing stage at which the supply of services takes place, would have to pay, under conditions of fair competition, to a supplier at arm's length within the territory of the Member State in which the supply is subject to tax*. Therefore for the conversion to a traditional currency one shall may the exchange rate provided by an exchange entity for a certain cryptocurrency in exchange for a traditional currency. Cryptocurrencies are highly volatile[57] even on daily basis, therefore if an exact moment of transaction is not known, the author suggests use of a daily average exchange rate. The second solution may be to use an open market value of goods sold or services provided. Firstly, Article 80 (1) of the Directive does not authorise Member States to take such approach in case of supplies to persons with a right of deduction. Secondly, it is even harder to establish the open market value of supplies such as other cryptocurrencies, tokens of intangible products. Thus the preferred solution should be the open market value of the cryptocurrency traded[58].

1.4 Taxable Person

Taxable person means any person who, independently, carries out in any place any economic activity, whatever the purpose or results of that activity[59]. The concept of taxable person is similarly to other VAT concepts an autonomous definition and is very broad. It is not limited only to persons who are licensed or

57 Dirk G Baur and Thomas Dimpfl, 'Excess Volatility as an Impediment for a Digital Currency' (Social Science Research Network 2018) SSRN Scholarly Paper ID 2949754 <https://papers.ssrn.com/abstract=2949754> accessed 9 June 2018.

58 compare with VAT Committee, 'Working Paper No. 854' <https://circabc.europa.eu/sd/a/19f564ce-3878-4a61-9b8c-f0dbf545465f/854%20-%20Commission%20-%20VAT%20treatment%20of%20Bitcoin%20(II).pdf>. p. 15.

59 Art. 9 VATD.

authorized to conduct a business. The "any person" includes even non EU entities and is not limited to profitable activities, as to whatever the purpose or results of the activity are. Anyone is not only an individual, but also a legal person, such as private or public limited companies, EEIGs and the Societas Europaea, joint ventures, consortia and partnerships, *even when lacking legal personality*, can be treated as a taxable person[60].

Even non-profit organizations may be taxable persons if they conduct an economic activity. In the case Lajvér[61] the applicants were non-profit organizations with the aim of constructing, and later operating, agricultural engineering works, namely, a water disposal system, a reservoir and a rainwater collection system, on land belonging to members of the companies. The works were financed through State and EU resources. The court concluded that such activities constitute an economic *activity, notwithstanding the fact that those works have in large part been financed by State aid and that their operation gives rise only to revenue from modest fees, provided that that fee can be regarded as having a 'continuing basis' on account of the period of time during which it is to be charged*. Let´s note the referring court was ordered to ascertain, whether there exists a direct link between the services supplied and the consideration.

As mentioned before, even a sale of shares exceeding 1.8 billion GBP of a charitable trust does not constitute economic activity[62] because of its nature of pure holding. We encounter huge volumes of funds for ICOs. In this respect, a similar treatment of own shares not constituting an economic activity may be considered.

The interesting question arises, whether a preparatory activities constitute an economic activity necessary to qualify one as a taxable person, because there is not an economic activity yet. In the Rompelman case[63] were bought two show-

60 Terra and Kajus (n 6). p. 198.

61 *Lajvér* CJEU C-263/15.

62 *Wellcome Trust* (n 47).

63 *Rompelman* CJEU C-268/83.

rooms in premises under construction, Rompelmans intended to lend these units to a commercial tenant as they are completed. The court concluded, that economic activity has to be interpreted broadly, while *economic activity includes any acts preparatory to the making of taxable supplies, such as the purchase of a lease.* The business may be unsuccessful, even an intention to commence an economic activity giving rise to taxable transactions constitutes the status of a taxable person for the purposes of VAT[64]. Except in cases of fraud or abuse, the status of taxable person for the purposes of VAT may not be withdrawn from that company retroactively where, in view of the results of preparatory activity, it has been decided not to move to the operational phase, but to put the company into liquidation, with the result that the economic activity has not given rise to taxable transactions. These conclusions are important for ICOS projects that are based on crowdfunding and are typically in the preparatory phase, as no service has been provided yet.

Finally, a taxable person has to perform the economic activity independently. Employed and other persons shall be excluded from VAT in so far as they are bound to an employer by a contract of employment or by any other legal ties creating the relationship of employer and employee as regards working conditions, remuneration and the employer's liability[65]. In the world of cryptocurrencies we may encounter rather informal business relationships and business relationships which are not established with intention of creating employment.

1.5 Place of Supply of Services and the Supply of Electronic Services

The basic rule says the place of supply of services to a taxable person acting as such shall be the place where that person has established his business[66], whereas the place of supply of services to a non-taxable person shall be the place

64 *INZO* CJEU C-110/94. para 25.

65 Art. 10 VATD.

66 Art. 44 VATD.

where the supplier has established his business[67]. The reality of anonymous and pseudonymous environment around cryptocurrencies does not really help with determination of the place of supply. If the place of supply is not within a Member State, the transaction falls outside the scope of VAT Directive. The following exceptions to the basic rule include many situations[68], however, since they are not applicable directly to situations involving cryptocurrencies, the author does not consider it necessary to discuss them.

As for business to customer relations, electronically provided services shall be taxed at the place where the customer is established, has his permanent address or usually resides[69]. '*Electronically supplied services' include services which are delivered over the Internet or an electronic network and the nature of which renders their supply essentially automated and involving minimal human intervention, and impossible to ensure in the absence of information technology*[70]. The definition of electronically supplied services includes namely[71]:

(a) the supply of digitised products generally, including software and changes to or upgrades of software;

(b) services providing or supporting a business or personal presence on an electronic network such as a website or a webpage;

(c) services automatically generated from a computer via the Internet or an electronic network, in response to specific data input by the recipient;

(d) the transfer for consideration of the right to put goods or services up for sale on an Internet site operating as an online market on which potential buyers make their bids by an automated procedure and on which the parties are notified of a sale by electronic mail automatically generated from a computer;

67 Art. 45 VATD.

68 Art. 46 to 59 VATD.

69 Art. 58 VATD.

70 Art. 7 Council Implementing Regulation No 282/2011.

71 Art. 7 (2) Council Implementing Regulation No 282/2011.

(e) Internet Service Packages (ISP) of information in which the telecommunications component forms an ancillary and subordinate part (i.e. packages going beyond mere Internet access and including other elements such as content pages giving access to news, weather or travel reports; playgrounds; website hosting; access to online debates etc.);

As well as other services listed in the Annex I of the Regulation. To conclude, the nature of such services is close to these provided via cryptocurrency markets or in relation to cryptocurrencies.

1.6 Financial Services and VAT Exemption

Financial services, including banking, and investment funds, are exempt financial transactions[72]:

(b) the granting and the negotiation of credit and the management of credit by the person granting it;

(c) the negotiation of or any dealings in credit guarantees or any other security for money and the management of credit guarantees by the person who is granting the credit;

(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);

72 Art. 135 (1) (a) to (g) VATD.

(g) the management of special investment funds as defined by Member States.

The reasons of the exemption are not specifically stated, however these may be covered under the impossibility of establishing taxable amounts and the amounts of deductible VAT without generating unacceptable administrative charges and without creating legal and accounting complexity both for economic operators and Member States' fiscal authorities[73]. This reasoning is surely applicable to transactions involving cryptocurrencies, as these two kinds of transactions are comparable. The counter argument may be derived from the nature of blockchain[74], where every transaction is easily traceable for unlimited period of time. If the ledger is accessible, the determination of the eventual tax base is only a question of use of computing power to set the tax base and hence the need of development of such automated tools for tax authorities.

The deduction of input VAT is generally not allowed as the financial services are exempted, without the right of deduction. The Member states *may* allow an exception with a right of option for taxation in respect to the provision of financial services[75]. There is an exception which allows the deduction in so far as the services which are exempt pursuant to points (a) to (f) of Article 135(1), are provided to the customer established outside the Community[76]. This concept leads to hidden VAT, which is caused by the impossibility of deduction of input VAT and makes inequalities between financial subjects securing the input services (i.e.

73 'Proposal for a Council Directive Amending Directive 2006/112/EC on the Common System of Value Added Tax, as Regards the Treatment of Insurance and Financial Services, A6-0344/2008', <http://www.europarl.europa.eu/sides/getDoc.do?type=REPORT&reference=A6-2008-0344&language=EN>.

74 Bashir (n 21). All users of the permission-less ledger maintain a copy of the ledger on their local nodes and use a distributed consensus mechanism in order to reach a decision about the eventual state of the ledger.

75 Art. 137 VATD.

76 Art. 169 VATD.

customer care, technical services, advisory services) in-house by their own employees in comparison to those which use outsourcing[77].

How to determine the tax base of an exchange, if no fee is charged? The case First National Bank of Chicago[78] concerns foreign exchange transactions where a bank quotes different exchange rates for their purchase and for their sale. The court held that it was a supply of service for consideration. The taxed transaction of a bank consisted only in the exchange margin itself, not in the whole amount of transfer of foreign currencies. The Court of Justice thus deemed the transfer to be neither the supply of goods nor of service because in this particular case, foreign currencies were legal tender. The Court of Justice basically deemed the difference between the purchase and sales price of the foreign currencies to be consideration for the taxable service of exchange. This also corresponds to the principle of taxation of consumption within the framework of VAT because foreign currencies may not be consumed and therefore, their mere exchange may not be subject to VAT.

The Granton Advertising[79] case dealt with cards which entitled their holders to a discount on purchase of goods and services. The cards did not enable their holders to acquire an ownership interest in Granton Advertising or a debt or any other right which is related to these rights. The Court did not exempt the transaction. As far as *the tax exemption provided for in Art. 135(1)(f) of the Directive is concerned, this provision applies to transactions in shares, interests in companies or associations [and] debentures, i.e. securities conferring a property right over legal persons as well as 'other securities' referred to in that provision that have to be regarded, at the very least, as also being 'securities'*[80].The court added here, the objectives of the exemp-

77 'Proposal for a Council Directive Amending Directive 2006/112/EC on the Common System of Value Added Tax, as Regards the Treatment of Insurance and Financial Services, A6-0344/2008', (n 73).

78 *First National Bank of Chicago* CJEU C-172/96.

79 *Granton Advertising* CJEU C-461/12.

80 *Hedqvist* (n 1). Para. 54.

tion for financial transactions is to alleviate the difficulties connected with determining the taxable amount and the amount of VAT deductible as mentioned in *Velvet & Steel* Immobilien[81] and Skandinaviska Enskilda Banken[82].The transactions exempt from VAT for their financial nature do not necessarily have to be carried out by banks or financial institutions[83].

1.7 Mixed and Composite Financial Services

As has been said, cryptocurrencies are not only Bitcoin. How to deal with security with combined aspects of a service? In particular, tokens discussed below may be of a different nature. What is strange, however, is that ICO tokens can change the nature of a "simple" protocol change. Likewise they can be a mixture of different services and assets.

In the decision in Sparekassernes Datacenter[84] the Court of Justice of the European Union concluded that the exemption depends on how the financial service is characterized, irrespective whether there is a contract or a direct link between the person providing it and the final consumer. The case concerned datacentre services securing banking transactions. Cryptocurrency mining is by its nature a provision of services which consists in verification of transactions for third parties. The court emphasised operations such as advice on, and trade in, securities, cover two different types of services. The first is a separate information service characterized by the supply of financial information to the banks. The second type form an integral part of the system of marketable securities. In order to be characterized as an exempt transaction, the transaction must have the effect of transferring funds and entail changes in the legal and financial situation. This service must be distinguished from a mere physical or technical supply, such as making a data-handling system available to a bank.

81 *Velvet & Steel Immobilien* CJEU C-455/05. para 24.

82 *Skandinaviska Enskilda Banken* CJEU C-540/09. para 21.

83 *Hedqvist* (n 1). para 37. *Velvet & Steel Immobilien* (n 81). para 21 and 22. *Granton Advertising* (n 79). para 29.

84 *Sparekassernes Datacenter* CJEU C-2/95.

The national court was ordered to examine in particular, whether the data-centre´s responsibility is restricted only to technical aspects or whether it extends to the essential aspects of the transaction[85].

The line between a financial service and an ordinary one is thin. In subsequent case, financial advisory and credit services were assessed. Mr Ludwig´s activity[86] firstly consisted in advising clients with regard to their financial situation and secondly, in ensuring they entered into a credit agreement system. A mere advisory regard to the financial situation is not an exempted supply. But if in the negotiation of credit offered by that taxable person is the principal service to which the provision of financial advice is ancillary, in such a way that the latter shares the same tax treatment as the former: *The fact that a taxable person analyses the financial situation of clients canvassed by him with a view to obtaining credit for them does not preclude recognition of the service supplied as being a negotiation of credit which is exempt.*

In the case of services rendered in connection with financial services, it is very difficult to distinguish which transactions are still exempted and which no longer fall within the definition of financial services within the meaning of the Directive. *A complex supply of services may be regarded as 'transactions concerning transfers' only where it has the effect of making the legal and financial changes which are characteristic of the transfer of a sum of money*[87]. It is questionable whether in the ruling of AXA UK[88] had the CJEU the intention of extending the categorization of a 'transaction concerning payments or transfers'. As it may be observed in the Bookit[89] and National Exhibition Center[90], the court remains on

85 ibid. para 66.

86 *Ludwig* CJEU C-453/05.

87 *Opinion of AG Saugmandsgaard Øe in DPAS Limited CJEU C-5/17. para. 35.*

88 *AXA UK CJEU C-175/09.*

89 *Bookit* CJEU C-607/14.

90 *National Exhibition Centre* CJEU C-130/15.

the criterion that transactions which do not in themselves involve the transfer of a sum of money are not exempted. Therefore the court rulings are still in line with the Sparekassernes Datacenter[91] conclusions.

In the event that an instrument, token or cryptocurrency confer more than one right, the question arises, whether it is still just one or multiple different supplies. A supply which comprises a single service from an economic point of view should not be artificially split. It would be a single composite supply, if from there is a principal service and the second service is only ancillary, because it does not constitute for customers their aim[92]. It is not decisive whether only single price is charged for more services, but *the single price may suggest that there is a single service.* It was followed in the case Levob[93], where a licence to a computer programme for insurance companies was granted. Following the licence, a customization and transposing of the programme into Dutch was provided, for a higher fee. The conclusion was, *such customisation predominates because of its decisive importance in enabling the purchaser to use the software customised to its specific requirements which it is purchasing*. Therefore it is important especially in the case of tokens and ICOs, what is felt by the customer as a predominant supply and what is the aim of purchase.

91 *Sparekassernes Datacenter* (n 84).

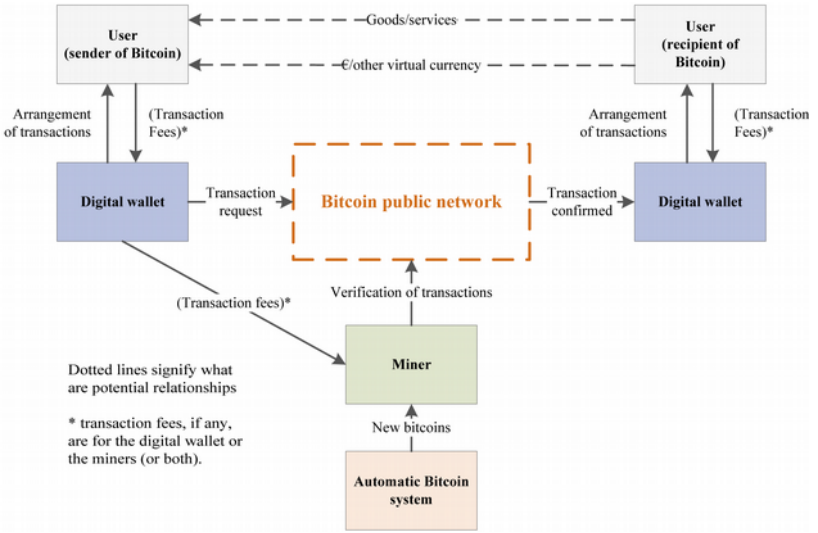
92 *CPP* CJEU C-349/96. para 29 and 30.

93 *Levob* CJEU C-41/04.

2 Exchange of Cryptocurrencies

2.1 Introductory Remarks

The exchange and sending of cryptocurrencies is not a simple transaction. At least two users´ addresses, one miner and the protocol in which the transactions are captured are involved. The transaction must be firstly verified by the miner. The incentive for the miner is, on the one hand, a reward in the form of a newly mined cryptocurrency and, on the other, a fee from a transaction paid by the sending user[94].



Bitcoin system diagram[95]

94 Bashir (n 21). p. 217.

95 VAT Committee, 'Working Paper No. 892' <https://circabc.europa.eu/sd/a/19f564ce-3878-4a61-9b8c-f0dbf545465f/854%20-%20Commission%20-%20VAT%20treatment%20of%20Bitcoin%20(II).pdf>. page 6.

EU VAT Committee presented three working papers[96] related to the VAT treatment of virtual currency. In the first working paper from July 2014, the committee stated that Bitcoin is more of a digital product or a negotiable instrument nature than i.e. a currency or e-money[97].

As for the possible qualification of Bitcoin as a security, the Committee denied this option. Bitcoin would only qualify as a security *for the purposes of Article 135(1)(f) of the VAT Directive if: (i) the acquisition of the instrument implies a transfer of rights related to the issuer of the instrument; and (ii) the transfer of such instrument has a financial nature, meaning that it can be exchanged for money or goods*. Bitcoin holders have no rights or claims against any entity or any similar rights[98]. According to the first working paper, if bitcoins were considered to be negotiable instruments, exchange services would fall within the exemption of Article 135(1)(d) of the VAT Directive. If bitcoins were seen as digital goods, these services would fall within the scope of VAT and no exemption would apply. As regards to the nature of Bitcoin as a voucher, the Committee concluded that vouchers are issued for a specific purpose, namely for the purchase of goods or services to be accepted in exchange for a voucher. They may already be specific at the time of release (specific goods or service provided by a particular contractor); or multipurpose and the voucher may allow the holder to choose goods or services to be received in exchange for a voucher. However, Bitcoin serves as a means of exchange for the purpose of obtaining any goods and services. The Bitcoin holder can freely choose the goods or services to be procured only by accepting the supplier as a cryptocurrency[99]. Bitcoin cannot therefore qualify as a voucher. The fol-

96 VAT Commitee Working Papers No. 811, No. 854 and No. 892. VAT Committee is an advisory committee for giving guidance on the application of the Council Directive 2006/112/EC of 28 November 2006 on the Common System of Value Added Tax.

97 VAT Committee, 'Working Paper No. 811' <https://circabc.europa.eu/sd/a/4adc83f8-a7ab-48ee-b907-468459c0dad7/49%20-%20VAT%20treatment%20of%20Bitcoin.pdf>.

98 ibid.

99 For details see Vouchers in Terra and Kajus (n 7). p. 865.

lowing year the Committee revisited the problem associated with the application of VAT on cryptocurrencies[100]. Being that time aware of the application problems of assessing Bitoin as a digital product, including for example the consideration of persons using it as taxable persons carrying out economic activity, the impossibility of identifying the purchaser, and thus complications in the determination of the place of performance or the creation of fraudulent schemes for input VAT deduction, it recommended treating bitcoin as a negotiable instrument.

On October 2015, the CJEU gave its first (and so far the only) decision with regards to the cryptocurrency exchange services. The *Hedqvist*[101] case dealt with a matter of performing transactions to exchange a traditional currency for cryptocurrencies through an exchange entity in return for payment of an exchange fee. It is the provision of services for consideration, which is subject to VAT. At the same time, it is the provision of financial services that are typically exempt from VAT[102]. According to the ruling, the *Article 135(1)(e) of Directive 2006/112 must be interpreted as meaning that the supply of services, which consist of the exchange of traditional currencies for units of the 'bitcoin' virtual currency and vice versa, performed in return for payment of a sum equal to the difference between, on the one hand, the price paid by the operator to purchase the currency and, on the other hand, the price at which he sells that currency to his clients, are transactions exempt from VAT, within the meaning of that provision*. The court concluded a mere exchange of a cryptocurrency for a traditional currency without any consideration is not a taxable supply and is not subject to VAT[103]. The exchange of cryptocurrencies for consideration is a financial service, mostly without a

100 VAT Committee, 'Working Paper No. 854' (n 58).

101 *Hedqvist* (n 1).

102 ibid.

103 For details see para. 17 and 18 of the Opinion of Advocate General J. Kokott in the case tried before the Court of Justice of the European Union, C-264/14 Hedqvist, The Court associated itself with the view of the Advocate General in this respect.

right to deduction of input VAT. The only exception is the provision of financial services with the place of supply outside the EU, i.e. to customers in third countries[104]. With regard to the fact that exchange offices are obliged to identify their client, they are able to determine an exact place of supply as well. In such cases, there would be a right to VAT deduction. The court therefore did not follow the opinion of the VAT Committee and assessed the nature of Bitcoin as a financial service.

The VAT Committee followed with the third working paper[105] and concluded, that supplies of goods and services remunerated by way of Bitcoin should be treated in the same was as any other supply for VAT purposes. This is the least problematic conclusion, but the problem arises when determining a tax base of transaction that was not negotiated in fiat-money but only in virtual currency units.

Services of digital wallets are outside VAT scope, if provided for no consideration, and otherwise exempt based on article 135(1)(e) of the VAT Directive[106]. Services related to intermediation supplied by exchange platforms are taxable and cannot benefit from any exemption[107].

2.2 VAT Treatment of Alternative Cryptocurrencies

A weak point in further following of the Hedqvist decision is in the conclusion of the Court of Justice that transactions involving non-traditional currencies in so far as those currencies have been accepted by the parties to a transaction as an alternative to legal tender and have no purpose other than to be a means of payment, are financial transactions[108]. Nowadays, there are more than 1,600

104 Art. 135 VATD

105 VAT Committee, 'Working Paper No. 892' (n 95).

106 ibid.

107 ibid.

108 Para. 49 of the quoted decision *Hedqvist* (n 1).

cryptocurrencies in circulation[109]. It is multiplicatively more than national currencies. Only a tiny percentage of transactions are paid in cryptocurrency and with the advent of more general use of cryptocurrency, we may paradoxically treat cryptocurrencies as a commodity rather than a currency. The above-mentioned only intended purpose, i.e. use as a currency, fades away in the context and volume of transactions performed.

In the case of alternative cryptocurrencies there is a significant difference in their purpose and method of exchange. Apart from the purpose of the payment instrument, alternative cryptocurrencies can also be used for running smart contracts or funding ICOs. We may distinguish between alternative cryptocurrencies and tokens[110]. Alternative cryptocurrencies have their own blockchain platform independent on the Bitcoin one. Tokens, in contrast, run on the existing blockchain, usually on the Ethereum[111]. Tokens are devoted to a separate chapter of this work, the author will continue to focus only on cryptocurrencies in the narrower sense in this chapter.

Ethereum is also the second largest cryptocurrency in terms of market capitalization[112]. How does Ethereum originate and how does it get to be exchanged? Ethereum started by a crowdfunding campaign and was exchanged for bitcoins in 2014 and 60 102 216 Ethereum (ETH) units were issued at the price of 1 000–2 000 ether per bitcoin (BTC)[113]. 9,9 percent of the total raised amount was allocated to the organization and the same amount was kept as a long term reserve, the rest was paid to developers and invested into development of

109 'Cryptocurrency Market Capitalizations | CoinMarketCap' (n 2).

110 Token. All about Cryptocurrency - Bitcoin Wiki' <https://en.bitcoinwiki.org/wiki/Token> accessed 9 June 2018.

111 *Wiki: The Ethereum Wiki* (ethereum 2018) <https://github.com/ethereum/wiki> accessed 9 June 2018.

112 'Cryptocurrency Market Capitalizations | CoinMarketCap' (n 2).

113 Joseph Bambara and Paul Allen, *Blockchain. A Practical Guide to Developing Business, Law, and Technology Solutions.* p. 103.

various blockchain projects[114]. Unlike Bitcoin[115], at Ethereum we know who is its founder. Satoshi Nakamoto, creator of Bitcoin, may be one entity, a group of people, or even a dead person. What is clear, that *it* owns or may control 980 thousand bitcoins, which is worth at the moment of more than 5 billion Euro, in fact € 5 978 000 000.[116] Nowadays, further Ethereum supply is mined similar to Bitcoin, but at the rate of 5 ETH on a blocktime target of 12 seconds[117].

114 ibid.

115 Satoshi Nakamoto, 'Bitcoin: A Peer-to-Peer Electronic Cash System' <https://bitcoin.org/bitcoin.pdf>.

116 'Satoshi 's Fortune: A More Accurate Figure' (*Bitslog*, 24 April 2013) <https://bitslog.wordpress.com/2013/04/24/satoshi-s-fortune-a-more-accurate-figure/> accessed 10 June 2018.

117 Bambara and Allen (n 113).

#	Name	Market Cap	Price	Volume (24h)	Circulating Supply	Change (24h)	Price Graph (7d)
1	BTC Bitcoin	$130,128,944,385	$7,616.89	$3,854,170,000	17,084,262	-0.13%	
2	ETH Ethereum	$60,369,650,243	$603.88	$1,517,060,000	99,969,117	0.54%	
3	XRP Ripple	$26,163,712,281	$0.666688	$181,663,000	39,244,312,603 *	-0.74%	
4	BCH Bitcoin Cash	$19,107,081,815	$1,112.54	$410,086,000	17,174,288	-0.96%	
5	EOS EOS	$12,835,190,717	$14.32	$1,170,240,000	896,149,492 *	2.06%	
6	LTC Litecoin	$6,810,132,391	$119.67	$246,041,000	56,906,648	-0.04%	
7	XLM Stellar	$5,319,434,750	$0.285941	$44,963,200	18,603,259,938 *	-1.76%	
8	ADA Cardano	$5,310,667,785	$0.204831	$51,695,100	25,927,070,538 *	-0.60%	
9	MIOTA IOTA	$4,653,044,875	$1.67	$69,549,800	2,779,530,283 *	-2.37%	
10	TRX TRON	$3,806,368,577	$0.057893	$171,342,000	65,748,111,645 *	0.19%	

Top 10 cryptocurrencies in terms of market capitalization , 9 June 2018[118].

Ripple (XRP)[119] is the third biggest cryptocurrency. It cannot be created by mining, but the protocol[120] is operated and transactions verified by the Ripple company and other entities, such as internet providers, Microsoft or MIT[121]. Instead of paying a fee to miners, certain amount or Ripple must be destroyed for the

118 'Cryptocurrency Market Capitalizations | CoinMarketCap' (n 2).

119 'Ripple' (*GitHub*) <https://github.com/ripple> accessed 9 June 2018.

120 David Schwartz, Noah Youngs and Arthur Britto, 'The Ripple Protocol Consensus Algorithm' <https://ripple.com/files/ripple_consensus_whitepaper.pdf>.

121 'Ripple's Distributed Ledger Network Passes 50-Validator Milestone' (*CoinDesk*, 17 July 2017) <https://www.coindesk.com/ripples-distributed-ledger-network-passes-50-validator-milestone/> accessed 9 June 2018.

transaction[122]. This system is clearly different from that used by Bitcoin or Ethereum protocol and does not lead to the creation of any new cryptocurrency units nor the payment of fees to miners.

The first obvious question is, whether Vitalik Buterin[123] and Gavin Wood[124] are taxable persons for the purpose of Directive because they are the creators of the Ethereum cryptocurrency and they issued it? They are indeed *any person*, *acting independently at any place.* But is the issue of a new cryptocurrency *an economic activity, whatever the purpose or results of that activity* in this particular case? As mentioned previously, 60 102 216 Ethereum (ETH) units were exchanged for bitcoins at the rate of 1 000–2 000 ether per bitcoin (BTC)[125]. 9,9 percent of the total raised amount was allocated to the organization and the same amount was kept as a long term reserve, the rest was paid to developers and invested into development of various blockchain projects. The author evaluates this as an economic activity, with clear link between service provided and the consideration, in line in previously presented EU case law.

The service provided by Ethereum project consists of provision of a protocol which allows the smart contracts to run[126]. If we assume the economic activity, is there any reason for exemption of such transactions? Firstly, we may not use the

122 'Transaction Cost - XRP Ledger Dev Portal' <https://developers.ripple.com/transaction-cost.html> accessed 9 June 2018.

123 Vitalik Buterin, 'Ethereum: A Next-Generation Cryptocurrency and Decentralized Application Platform' (*Bitcoin Magazine*) <https://bitcoinmagazine.com/articles/ethereum-next-generation-cryptocurrency-decentralized-application-platform-1390528211/> accessed 10 June 2018.

124 DR GAVIN WOOD, 'Ethereum: A Secure Decentralised Generalised Taransaction Ledger' <http://gavwood.com/Paper.pdf>.

125 Bambara and Allen (n 113).p. 103.

126 Alex Norta, 'Creation of Smart-Contracting Collaborations for Decentralized Autonomous Organizations' (2015).

Hedqvist[127] conclusions, because Ethereum is not virtual currency with no other purpose than to be a means of payment and that it is accepted for that purpose by certain operators. In fact, the purpose is both to be a means of payment and to be used for running the smart contracts. From this point of view, we may not classify Ethereum as a legal tender.

As for the security aspect, the tax exemption provided for in Art. 135(1)(f) of the Directive is concerned, this provision applies to transactions in shares, interests in companies or associations [and] debentures, i.e. securities conferring a property right over legal persons as well as 'other securities' referred to in that provision that have to be regarded, at the very least, as also being 'securities'[128]. It seems Ethereum may not qualify as other security, because it does not impose any right towards concrete entity. In this aspect, Ethereum resembles Bitcoin[129].

The court concluded the Bitcoin unlike a debt, cheques and other negotiable instruments referred to in Article 135(1)(d) of the VAT Directive, is a direct means of payment between the operators that accept it[130]. Ethereum a contrario is not a direct means of payment. All the other arguments[131] for treating it as a financial instrument prevail and the author proposes to treat both sale and exchange of Ethereum rather as a transaction with negotiable instrument, not a means of payment. Therefore the transaction consisting of an issue of a new cryptocurrency in exchange for a former cryptocurrency with aim of provision of further services is an economic activity, whereas the transaction is exempted as a transaction involving negotiable instruments.

As for the other cryptocurrencies, one must on case-to-case basis assess, whether there is no other purpose of the cryptocurrency than to be a means of

127 *Hedqvist* (n 1).

128 ibid. Para. 54.

129 VAT Committee, 'Working Paper No. 811' (n 97).

130 *Hedqvist* (n 1). para. 42.

131 Especially difficulties connected with setting the tax base and difficult to overcome compliance costs.

payment and that it is accepted for that purpose by certain operators. For example aforementioned Ripple or Litecoin seem to have that only purpose. If the only purpose is not to be a means of payment, one must assess, whether there is a reason for exemption based on classification of the cryptocurrency as a negotiable instrument, such as Ethereum. If there is no purpose of being a means of payment nor grounds for classification as a negotiable instrument, such trade of an cryptocurrency may be classified as a electronic service (in B2C relationships) or a standard service (in B2B relationships). Among the high number of cryptocurrencies exceeding 1600 is impossible to find one-fits-all solution.

2.3 Case Study - LocalBitcoins.com

LocalBitcoins.com[132] is a peer to peer Bitcoin exchange, where one may trade directly with another person. LocalBitcoins.com is operated by LocalBitcoins Oy, a Finnish legal entity. Registering, buying, and selling Bitcoin is free, but there is a fee of 0,5 % for use of the merchant invoicing system. The fee is also paid if the invoice is paid with an external transaction outside the LocalBitcoins.

132 'About LocalBitcoins.Com' <https://localbitcoins.com/about> accessed 10 June 2018.

A chart with offers of bitcoin for cash[133]

One may explore the preferences of sellers to meet at public spaces, exchanging the bitcoin for cash. We may not expect any proper taxation or VAT compliance in this aspect. At the same site there is option of purchase of bitcoins via a wire transfer. If the transfer is used with the provided invoicing system, no VAT is billed. According to the aforementioned VAT Committee working paper, services related to intermediation supplied by exchange platforms are taxable and cannot benefit from any exemption[134]. This may lead to non-compliance issues.

133 'Buy Bitcoins Online or with Cash - Fast and Easy' <https://localbitcoins.com/buy_bitcoins> accessed 10 June 2018.

134 ibid.

3 Mining of Cryptocurrencies

3.1 Introductory Remarks

Bitcoin mining is an energy-intensive activity. Lately, voices have been heard that electricity consumption to "produce" this cryptocurrency is disproportionately high. At the same time, it is estimated that mining consumes 71.12 TWh of electricity per year[135]. Compared to 106 TWh of electricity consumed per year in the Netherlands it is an impressive number[136].

Bitcoin mining is a resource intensive process on purpose. New blocks are added to the blockchain by a mining process, where the transactions contained in one block are validated.[137] The difficulty in consuming resources ensures that nobody has sufficient (greater than 50 %) of total mining power to be able to change the blockchain.

This also secures the system against frauds and double spending attacks while adding more virtual currency to the Bitcoin ecosystem [138]. *New blocks are created at an approximate fixed rate. Also, the rate of creation of new bitcoins decreases by 50%, every 210,000 blocks, roughly every 4 years. When bitcoin was initially introduced, the block reward was 50 bitcoins; then in 2012, this was reduced to 25 bitcoins. In July 2016, this was further reduced to 12.5 coins (12 coins) and the next reduction is estimated to be on July 4, 2020. This will reduce the coin reward further*

135 'Bitcoin Energy Consumption Index' (*Digiconomist*) <https://digiconomist.net/bitcoin-energy-consumption> accessed 10 June 2018.

136 'Energy Consumption in the Netherlands' (*Worlddata.info*) <https://www.worlddata.info/europe/netherlands/energy-consumption.php> accessed 10 June 2018.

137 Bashir (n 21). p. 217.

138 ibid. 217.

down to approximately six coins[139]. At the moment, the reward obtained for one block is 12.51 to 12.74 BTC, including user paid transaction fees[140].

There is a relationship between the hardware used and the capacity of solving the complex calculations. One may wonder whether mining may establish a supply of services which consist in verification of transactions for third parties for consideration. Similar thoughts may be found in the VAT Committee working paper[141]. *Consequently, mining activities could be seen as an economic activity and, under the given circumstances, they would constitute a supply of services for consideration. If bitcoins were instead considered to be negotiable instruments, verification services provided by miners would fall within the exemption of Article 135(1) (d) of the VAT Directive*[142]. While digital wallet platforms allow interaction between all the actors of the Bitcoin scheme, miners are those who ultimately verify transactions and ensure that they are carried through. Hence, it is difficult to exclude miners from actually providing services concerning the arrangement of transactions in bitcoin[143].

However, the established case law of the Court of Justice of the European Union requires aforementioned conditions to be met in order to constitute an economic activity which is subject to VAT, and thus a direct link between a service provided and consideration received[144]. When mining cryptocurrency, the services provided are in most cases wasted because the transactions are simply not verified. The consideration is based on coincidence and there is an insufficient link between a particular activity and the consideration.

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139 ibid. 217.

140 'Bitcoin Block Explorer - BTC.Com' <https://btc.com/> accessed 10 June 2018.

141 VAT Committee, 'Working Paper No. 811' (n 97).

142 ibid.

143 ibid.

144 *Apple and Pear Development Council* (n 49).

The British HM Revenue & Customs adopted a public opinion that income received from Bitcoin mining activities will generally be outside the scope of VAT on the basis the British HM Revenue & Customs that the activity does not constitute an economic activity for VAT purposes because there is an insufficient link between any services provided and any consideration received[145]. The opinion of HM Revenue & Customs was incorporated in the renowned commentary on the directive on the common system of VAT so the author of this work suppose the opinion will be followed in other Member States[146].

This opinion was adopted as well by the German Ministry of Finance in its last statement which states that a transaction fee is paid on a voluntary basis and is not directly linked with the service provided[147]. This corresponds to judiciary conclusions where no particular customer of a service is given, the fee amount is voluntary and a legal relationship between a supplier and a customer is missing as in Tolsma case[148]. As for doctrinal conclusions, the same is stated by Wolf in the paper of 2014[149], repeatedly then in the paper of 2016[150].

In the decision in Sparekassernes Datacenter[151] the Court of Justice of the European Union concluded that the exemption depends on how the financial

145 'Revenue and Customs Brief 9 (2014): Bitcoin and Other Cryptocurrencies' (*GOV.UK*) <https://www.gov.uk/government/publications/revenue-and-customs-brief-9-2014-bitcoin-and-other-cryptocurrencies/revenue-and-customs-brief-9-2014-bitcoin-and-other-cryptocurrencies> accessed 6 June 2018.

146 Terra and Kajus (n 7). p. 2074.

147 Umsatzsteuerliche Behandlung von Bitcoin und anderen sog. virtuellen Währungen. <http://bit.ly/vatgemin>.

148 *Tolsma* (n 39).

149 Redmar A Wolf, 'Bitcoin and EU VAT' [2014] International VAT Monitor.

150 Redmar A Wolf, 'Virtual Currencies, M-Payments and VAT: Ready for the Future?', Bitcoin and Mobile Payments (Springer 2016). p. 247.

151 *Sparekassernes Datacenter* (n 84).

service is characterized, irrespective of whether there is a contract or a direct link between the person providing it and the final consumer[152].

In the event that a tax entity, a cryptocurrency miner, provides other services in connection with a particular transaction for particular consideration, it will be a treated as a financial service[153].

The opposite known opinion within the EU states is the one from Poland. The opinion of the Polish financial administration was also subject to judicial review by a court in Łódź[154], where the court concluded that cryptocurrency mining is a standard service provided for consideration, without exemption. The court was not dealing with opinions of foreign financial administrations or other professional resources. Of course, until a unifying decision is adopted by the Court of Justice, it may be expected that not all Member States will proceed uniformly but I would expect at least some arguments resulting from the EU law when it comes to interpretation of VAT.

To answer the question, whether Cryptocurrency mining activities are generally outside the scope of VAT, it is necessary to closer examine the link between the activity and received payment.

3.2 Pool Mining

Mining in so called mining pool still remains unsolved[155], because the mechanism of the pool itself ensures a predictable ratio between supplied computational power and the remuneration received. Simply said, members of the mining pool provide their computer performance to an entity operating the mining pool, which, if the mining process is successful, distributes the

152 'Revenue and Customs Brief 9 (2014): Bitcoin and Other Cryptocurrencies' (n 145).

153 ibid.

154 District Court in Łódź, Poland I SA/Łd 54/16.

155 For instance Czech 'SlushPool' (*slushpool.com*) <https://slushpool.com/home/> accessed 6 June 2018. It is the oldest mining pool.

remuneration from the mined block by a certain mechanism among the miners. The entity, a mining pool, receives consideration for generating a block of cryptocurrency and subsequently splits the consideration among the members according to their share of computing power provided. Mining in the mining pools significantly increases the probability of receiving consideration, even if split among individual members of the mining pool according to their computer performance. In this particular situation, a closer link between a service and consideration and being subject to VAT could be considered. However, we necessarily come across the nature of the transaction - if it is lease of computer performance to an entity operating the mining pool or just coordination of provision of mining services. The question is comparable to Sparekassernes Datacenter[156]. With regard to the fact that the entity operating the mining pool actually disposes of the cryptocurrency mined[157] and subsequently splits it upon request of members, the author inclines to the interpretation that it is the provision of services to a taxable person (because the mining pool provides its services to particular persons for particular consideration) which consists in the provision of computer performance. At the same time, the consideration for cryptocurrency mining is foreseeable under the computer performance provided by the member of the mining pool. The nature of provided service by the member of mining pool is rather a mere technical and computational power. The member does not have any control over specific transactions nor a direct control of mined cryptocurrency, both these aspect are fully controlled by the pool entity, which is the full node.

To understand better the mechanism behind the distribution of remuneration, we should explore closer the different ways of distributing profits. Pools provide their services for a fee (of 0 to 4 %) and distribute the rewards[158].

156 *Sparekassernes Datacenter* (n 84).

157 The mining pool operator only is a full node and receives consideration for the block mined, within the meaning of the text by Nakamoto (n 115).

158 'Comparison of Mining Pools - Bitcoin Wiki' <https://en.bitcoin.it/wiki/Comparison_of_mining_pools> accessed 10 June 2018.

Proportional Reward System

How is the computational power linked with the remuneration? The proportional system, is the simplest one. The mined block is distributed to all miners according to the ratio of the work done to the total work in the given round. The round is a period of time from the moment of the last distribution of the block among the pool participants, till the moment the last share that created the block has been deposited. Simply put, the round is equal to the time between the two blocks found.

Each member of the pool is providing the computational power. I.e. a block is found after 10 000 shares of power, whereas you have cast 1 000 shares. Your remuneration will be 1/10 of the total prize, which may be 12,5 BTC. You will receive 1,25 BTC, the rest will be distributed to other members of the pool.

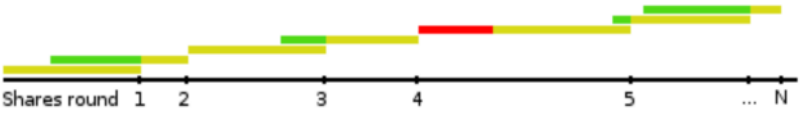
Unfortunately, this system is vulnerable to hoppers[159]. Hoppers do mine in the pool only in the good times and leave at the bad times, maximizing this way their profit. In this system, the continuous miners are damaged by hoppers and their loss depends on the ratio between hoppers and ordinary miners.

As you may observe, the moment of creation of verification of a block within the activity rendered inside the pool is important, not the verification of the blocks made by other miners outside the pool. As the reward for the block is known upfront and the difficulty of the verification of the block as well, it has good predictability on the basis of how much computational power is needed to receive a certain remuneration.

159 'Mining Profitability - What Is Pool Hopping?' (*Bitcoin Stack Exchange*) <https://bitcoin.stackexchange.com/questions/5072/what-is-pool-hopping?utm_medium=organic&utm_source=google_rich_qa&utm_campaign=google_rich_qa> accessed 10 June 2018.

Pay Per Last Number of Shares

Randomness is an unwanted aspect even among miners, as well as the problem of black passenger in the form of hoppers. Therefore a system of pay per last number of shares is used in many mining pools.



PPLNS scheme[160]

To explain the scheme, each round means the time between a new block is mined. Round 1 and 3 are proportional, the reward is proportionally distributed as in the proportional system. Rounds 2 and 4 are shorter. Round 5 is greatly longer. In proportional system, during the round 2 and 4, continuous miners would be better-off than hoppers; in round five, any hopper joining the pool after start of the round would be better-off than continuous miners. PPLNS solves this problem by attributing imaginary average share to the miners in the pool based on their performance provided during the mining of previous blocks.

The PPLNS does not take into account the surrendered shares from a given round (from block to block) but always the last N shares. This number is determined by different methods (dynamically and fixedly, originally as double the current complexity)[161].

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160 'What Is PPLNS » Give Me' <http://give-me-coins.com/support/faq/what-is-pplns/> accessed 6 June 2018.

161 ibid.

In practice, PPLNS is better system for those who want to mine one currency for a long time. As you may observe, this mechanism minimizes the luck-factor, or the random connection between the activity and consideration.

3.3 Alternative Mining Methods

There are numerous alternative methods to the proof of work concept[162]. The proof of work as mentioned is very resource demanding. Although it is extremely resource demanding to acquire more than 50% share of the computational power in the network, as for instance the Verge cryptocurrency suffered a 51% attack[163].

The proof of stake[164] concept grants the holders of a specific cryptocurrency an option of minting which is a form of mining a cryptocurrency. In fact, the owner receives a cryptocurrency without any highly demanding activity. The transactions are verified by the consent of the holder of the cryptocurrency The minted cryptocurrency is an interest, whereas the link between amount of held cryptocurrency and the interest is clearly set.

162 Iddo Bentov, Ariel Gabizon and Alex Mizrahi, 'Cryptocurrencies Without Proof of Work', *Financial Cryptography and Data Security* (Springer, Berlin, Heidelberg 2016) <https://link.springer.com/chapter/10.1007/978-3-662-53357-4_10> accessed 10 June 2018.

163 Kai Sedgwick, 'Verge Is Forced to Fork After Suffering a 51% Attack' (*Bitcoin News*, 5 April 2018) <https://news.bitcoin.com/verge-is-forced-to-fork-after-suffering-a-51-attack/> accessed 10 June 2018.

164 Sunny King and Scott Nadal, 'Ppcoin: Peer-to-Peer Crypto-Currency with Proof-of-Stake' <https://pdfs.semanticscholar.org/0db3/8d32069f3341d34c35085dc009a85ba13c13.pdf>.

Proof of activity[165] is a protocol combining the Proof of Work component with a Proof of Stake. This protocol incentivizes non-miners to retain their online connection to the network and should eliminate inflation occurred in proof of stake models.

Proof of Checkpoint, The principle of the proof of burn protocol is as mentioned to destroy one cryptocurrency, i.e. one unit of bitcoin, and to obtain an alternative cryptocurrency, i.e. slimcoin[166]. This is a way how the new cryptocurrency may gain its value derived from the burnt one.

There are more alternatives to proof of work, and new ones are emerging, such as Proof of Capacity, Proof of Cooperation, Proof of Membership, Proof of Existence[167]. In the case of an assessment of whether an economic activity is economic, it is divisive whether there is a sufficient direct link between the activity and consideration. If yes, the transaction may be exempt as under Article 135(1)(d) of the Directive, which needs case-to-case approach. Furthermore, in the case of proof of stake, there is no relevant activity being performed, thus the transaction falls outside the scope of VAT.

3.4 VAT Treatment of Mining

A mere mining of cryptocurrencies is based on coincidence, as the probability of finding a correct solution for presented complex mathematical problem is very low. According to the EU case tax law, a consideration which is matter of chance,

165 Iddo Bentov and others, 'Proof of Activity: Extending Bitcoin's Proof of Work via Proof of Stake [Extended Abstract]Y' (2014) 42 SIGMETRICS Perform. Eval. Rev. 34.

166 Slimcoin whitepaper in *Slimcoin: SLIMCoin Official Repository* (n 25). For further details see 'Proof of Burn - Bitcoin Wiki' (n 25).

167 David Kariuki, 'Alternatives to Proof of Work' (*Cryptomorrow - Cryptocurrency, Bitcoin, Ethereum*, 28 August 2017) <http://www.cryptomorrow.com/2017/08/28/alternatives-to-proof-of-work/> accessed 10 June 2018.

does not constitute a direct link between the activity and the consideration needed for fulfilling the aspects of taxable economical activity[168].

As may be observed, the system of pool mining ensures the members of the pool are predictably remunerated for their provided activity. Whereas the main argument for treating mining activities as outside of the scope of VAT for insufficient link between the activity and a consideration, the pool mining resolves the uncertainty. The relationship as for the remuneration for the activity is between the entity operating the pool and the pool member. There is no direct relationship between the pool miner and the person whose transaction is verified.

To answer the question, whether are Cryptocurrency mining activities are generally outside the scope of VAT, it is necessary to examine closer the link between the activity and the received payment.

If the mining activity constitutes a taxable economic activity, we have to ask, whether the Article 135(1)(d) of Directive 2006/112 shall be interpreted as meaning the provision of services in connection with the verification of specific transactions for which specific charges are made, it will be exempt as falling within the definition of 'transactions, including negotiation, concerning deposit and current accounts, payments, transfers, debts, cheques and other negotiable instruments,' as is suggested by HMRC[169]? An important distinguishing criterion is that the transaction must have the effect of transferring funds and entail changes in the legal and financial situation. This service must be distinguished from a mere physical or technical supply, such as making a data-handling system available similar to the provision of such a system to a bank[170].

The full node (a sole miner or a mining pool entity) of the blockchain protocol provides the service of verification of transactions and controls the process of such verification. A member of a mining pool has no control over verification of

168 *Tolsma* (n 39). and *Baštová* (n 53).

169 'Revenue and Customs Brief 9 (2014): Bitcoin and Other Cryptocurrencies' (n 145).

170 *Sparekassernes Datacenter* (n 84).

the whole block and has only a contractual relationship with the full node which distributes the remuneration. The member of the pool provides only the computational power of the hardware and in fact is not in control of the verification process. Therefore in line with the Sparekassernes Datacenter[171] decision the author favors the classification of transactions of members mining in a pool as non-exempt from VAT. The activity of a mining pool itself or a sole miner consisting of the mining of a new cryptocurrency will fall outside the scope of VAT or, if the direct link between activity and the consideration in specific cases is established, an exempt transaction under Article 135(1)(d) of the Directive. The activity of a mining pool consisting of accepting fees from members of the mining pool for pool-related services and falls within the scope of VAT and is a necessary part of the process of verifying transactions within a blockchain, and thus is also exempted under Article 135(1)(d) of the Directive.

171 ibid.

4 Tokens and ICOs

4.1 Introduction

Transactions with cryptocurrencies definitely do not cover just trading on bitcoins. Initial Coin Offerings[172] (ICOs) are becoming more and more popular. It is an offer of a new cryptocurrency that may be purchased typically in the form of tokens. In 2017, the total amount of funds raised via ICOs approached USD 4 billion[173] which is a significant amount for regulators. It is a specific form of investments being characterized by high risks and the lack of any central regulation. These are Initial Coin Offerings similar to the IPOs, which we know well from the financial world[174].

A new cryptocurrency may have different purposes. If the new cryptocurrency is predominantly used analogously as means of payment, we typically talk about a new *cryptocurrency*. Alternative cryptocurrencies have their own blockchain platform independent on the Bitcoin one. Tokens, in contrast, run on the existing blockchain, usually on the Ethereum[175]. Similarly if for example rights associated with the cryptocurrency analogous to the rights of a company member prevail, we would talk about *tokens*. We may distinguish between:

1) Cryptocurrency, as we know Bitcoin, Ethereum or Litecoin,

2) Utility tokens, which include a right to do or obtain something,

172 Osi Momoh, 'Initial Coin Offering (ICO)' (*Investopedia*, 20 December 2016) <https://www.investopedia.com/terms/i/initial-coin-offering-ico.asp> accessed 6 June 2018.

173 'EY Research: Initial Coin Offerings (ICOs)' <http://www.ey.com/Publication/vwLUAssets/ey-research-initial-coin-offerings-icos/$File/ey-research-initial-coin-offerings-icos.pdf>.

174 See i.e. Aleksandra Bal, 'VAT Treatment of Initial Coin Offerings' 2018.

175 *Wiki: The Ethereum Wiki* (n 111).

3) Security tokens, representing similar rights, such as with stocks – the right to vote, the right to share in profitability and the right to share the liquidation balance,

4) Asset tokens, which may represent a real asset. All these may have different tax treatment because of their completely diverse nature.

The *Utility tokens* represent the current or future right, typically connected with provision of services. The problem arises when the ongoing token sale relates to future provision of a service about which we have no idea regarding the question *what* will be provided.

Security tokens represent right similar to the rights of shareholders. Under the Article 135(1)(f) of Directive 2006/112 Member States shall exempt the 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). However does this provision also apply to the security tokens?

Finally, *asset tokens* representing real assets, but are not the assets itself. Do the transactions with these tokens fall within the scope of VAT? If so does it fall within the Article 135(1)(f) of Directive 2006/112 Member States shall not exempt the transactions including documents establishing title to goods, and the rights or securities referred to in Article 15(2)?

4.2 Aspect of a means of payment

A mere exchange of a cryptocurrency for a traditional currency is not a taxable supply and is not subject to VAT[176]. As in the Hedqvist case[177], the Court dealt

176 For details see par. 17 and 18 of the Opinion of Advocate General J. Kokott in the case tried before the Court of Justice of the European Union, C-264/14 Hedqvist, the Court associated itself with the view of the Advocate General in this respect.

177 *Hedqvist* (n 1).

particularly with the assessment of the nature of transactions to exchange a cryptocurrency for a traditional currency and vice versa and with a margin which is to be received by a service provider upon the exchange is only subject to value added tax[178]. In previous part was discussed the problem of cryptocurrencies which are not intended to be used only as a means of payment.

The transaction of exchange performed for a fee is exempt within the meaning of Article 135(1)(e) of the Directive[179]. Transactions, including negotiation, concerning currency, bank notes and coins used as legal tender, except for collectors' items, such as, gold, silver or other metal coins or bank notes which are not normally used as legal tender or coins of numismatic interest are tax exempt[180]. Therefore it is an exempt transaction without any right of deduction. The Court followed from the conclusion that *"the bitcoin virtual currency has no other purpose than to be a means of payment and that it is accepted for that purpose by certain operators"*[181]. As was proposed previously, alternative cryptocurrencies with other purpose than a means of payment should be treated rather as a transaction with negotiable instrument, not a means of payment. Therefore the transaction consisting of an issue of a new cryptocurrency in exchange for a former cryptocurrency with aim of provision of further services is an economic activity, whereas the transaction is exempted as a transaction involving negotiable instruments.

Despite this fact, the domestic as well as foreign practice in the EU is clear. Transactions relating to an exchange of a cryptocurrency for another cryptocurrency or are not treated as a subject to VAT.

The practice, in fact, extends the interpretation of Art. 135(1)(e) of the Directive. The humorous fact is, that Bitcoin itself may be used for a purpose other than a means of payment. For instance, a cryptographic code may be inserted in its

178 Wolf (n 150). p. 243.

179 VATD

180 Art. 135(1)(e) VATD:

181 *Hedqvist* (n 1). Para. 52.

blockchain[182]. So, the basis of the Court in the Hedqvist[183] case has been erroneous from the very beginning. Therefore, the author expects new case law dealing with these contradictions. However, it seems practical to assess whether a cryptocurrency has or does not have *a prevailing* purpose of a means of payment.

Ethereum, as mentioned, may be a typical example of a new cryptocurrency[184]. The Ethereum project was launched in 2014 and collected 31.5 thousand bitcoins (in that time, it equalled USD 18 million, today it equals approximately USD 340 million) for 60 million distributed Ethereum tokens. From the market capitalization point of view, it is the second biggest cryptocurrency[185]. However, Ethereum is not only a cryptocurrency in the narrower sense of the word. It is a platform which serves for running Smart contracts, i.e. contracts in the form of a cryptographic code[186]. From the tax point of view, the crucial question is whether a condition is met that Ethereum has no other purpose than the purpose of a means of payment and that it is accepted by certain economic operators for this purpose. The answer is obvious, Ethereum has another purpose apart from the purpose of a means of payment[187]. Ethereum is not the only new cryptocurrency. Today, there are more than 1 600 cryptocurrencies in circulation[188] and it is obvious that not all of them fulfil this purpose of a means of payment.

182 Ken Shirriff, 'Hidden Surprises in the Bitcoin Blockchain and How They Are Stored: Nelson Mandela, Wikileaks, Photos, and Python Software' <http://www.righto.com/2014/02/ascii-bernanke-wikileaks-photographs.html> accessed 6 June 2018.

183 *Hedqvist* (n 1).

184 Prableen Bajpai CFA (ICFAI), 'Ethereum' (*Investopedia*, 24 February 2016) <https://www.investopedia.com/terms/e/ethereum.asp> accessed 6 June 2018.

185 'Cryptocurrency Market Capitalizations | CoinMarketCap' (n 2).

186 .Alexander Savelyev, 'Contract Law 2.0: "Smart" Contracts as the Beginning of the End of Classic Contract Law' (2017) 26 Information & Communications Technology Law 116. p. 117.

187 *First National Bank of Chicago* (n 78).

On the other hand, some tokens have one of the main purpose as a means of payment as well, such as EOS[189] or TRON[190]. In such cases the author inclines more to the tax treatment as the transactions are made with negotiable instruments.

4.3 Service aspect

It is estimated that 68 % of tokens entitle their users to use services. It is an absolute majority of all ICOs[191]. If the purpose of a token does not consist in its use as a means of payment but in the entitlement to draw certain services, we can hardly think of meeting conditions according to First National Bank of Chicago[192] and Hedqvist[193] cases. Consideration for the sale of such token will be subject to VAT and I see no reason for tax exemption. However, it is obviously not a sale of goods, but provision of a service.

Tokens are typically sold before a service itself is provided because service providers finance their future development and operation from the funds raised in ICO. A duty to declare tax upon the supply of goods or provision of a service arises as of the date of a taxable supply. If a payment is received before the taxable supply, the duty to declare tax from the amount received arises as of the date on which the payment is received. It does not apply if the taxable supply is

188 'Cryptocurrency Market Capitalizations | CoinMarketCap' (n 2).

189 'EOSIO Developer Portal - EOSIO Development Documentation' <https://developers.eos.io/> accessed 10 June 2018.

190 'TRON | Decentralize The Web' <https://tron.network/index?lng=en> accessed 10 June 2018.

191 Saman Adhami, Giancarlo Giudici and Stefano Martinazzi, 'Why Do Businesses Go Crypto? An Empirical Analysis of Initial Coin Offerings' (Social Science Research Network 2018) SSRN Scholarly Paper ID 3046209 <https://papers.ssrn.com/abstract=3046209> accessed 6 June 2018. p. 2.

192 *First National Bank of Chicago* (n 78).

193 *Hedqvist* (n 1).

not known in sufficient detail as at the date on which the payment is received[194]. Nevertheless, it must be accumulatively met that the details of the goods to be supplied or services to be provided, a tax rate of a taxable supply and a place of performance are known. In respect of tokens, neither the service itself nor the place of performance will be typically known in advance in sufficient detail[195]. Since the services are provided worldwide and it is not clear in advance which token holder in particular uses the service, there are several places of performance, either in the regime of a standard service or electronically supplied services. The duty to declare and pay tax typically arises once the service is supplied or as of the date on which a tax document is issued. In this aspect, utility tokens have more the nature of multi-purpose vouchers and should be treated that way.

On the other hand, a transfer of single-purpose voucher is immediately treated as a supply of services which the voucher grants[196]. This is not a common case of ICOs, as these projects are similar to crowdfunding[197] and at the time of ICO they are only in the preparatory phase and do not provide any services or goods.

Tokens themselves typically only grant a future right to obtain a service and does not mean a provision of a service. If this is the case, it is necessary to examine the nature of the underlying service and to ascertain whether the service itself does not fill the characters of the electronic service provided to non-taxable person. *Electronically supplied services' include services which are delivered over the Internet or an electronic network and the nature of which renders their supply essentially automated and involving minimal human intervention, and*

194 *BUPA Hospitals Ltd* CJEU C-419/02.

195 For details see i.e. Terra and Kajus (n 7). p. 1368.

196 Bal (n 174). p. 8.

197 For details see i.e. Merkx Madeleine, 'The VAT Consequences of Crowdfunding' (Social Science Research Network 2016) SSRN Scholarly Paper ID 3112131 <https://papers.ssrn.com/abstract=3112131> accessed 10 June 2018.

impossible to ensure in the absence of information technology[198] In that case, it would be necessary to consistently tax the service at the place of residence of the customer and the basic rule for determining the place of supply would not apply.

4.4 Security aspect

25% of tokens include certain voting rights and 26% of tokens also include rights analogous to a right to a corporation's profit share[199].

How to proceed when selling tokens which include rights analogous to the rights of a company member? The increase of registered capital itself by a share issue or by a new contribution of a company member is not subject to VAT[200]. Income consisting of dividends does not constitute an economic activity.[201] *The 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) are tax exempt*[202]. As can be seen from the wording, within the scope of VAT are transactions, which include the subsequent transactions in securities, not their issue[203].

Unfortunately, tokens may be classified neither as an interest in a company, nor securities. Typically, there is no formal subscription of shares. This opens a space that the sale of tokens will be subject to tax as a supply of a standard service. The judgment of Granton Advertising[204] provides some guidance. Tokens in their nature are really close to ownership interests if they include rights analogous to

198 Art. 7 Council Implementing Regulation No 282/2011.

199 Savelyev (n 72). p. 117.

200 *Kretztechnik* CJEU C-465/03. Para. 27.

201 *KapHag* (n 46). Para. 38. *Polysar* (n 44).

202 Article 135(1)(f) of the Directive.

203 For details see i.e. Terra and Kajus (n 6). p. 678.

the rights of company members. Therefore, the author of this work would incline to the interpretation in favour of exemption in accordance with Granton Advertising case. In support of this conclusion it is possible to refer to the argument *a contrario* in the case of Hedqvist[205]: *The provision covers, inter alia, transactions in 'shares, interests in companies or associations, debentures and other securities', namely securities conferring a property right over legal persons and 'other securities' that have to be regarded as being comparable in nature to the other securities specifically mentioned in that provision.* It is therefore necessary to assess on a case-by-case basis whether the security token confers similar rights as securities.

4.5 VAT Treatment of Tokens

With respect to the above mentioned, there is certainly no general rule available for all types of tokens. It is necessary to distinguish the purpose of its issue and the intention of the customer. Furthermore, it is crucial to determine what part of the performance is decisive and whether or not it involves more independent services or just one main one, and the others are only ancillary[206]. In this respect, it is important to note that it is not decisive whether one price is charged for the token, or vice versa, whether the payment for one transaction is spread over several items[207].

Firstly we need to find out if a cryptocurrency is a token. If the cryptocurrency has its own blockchain and serves only as a means of payment, then it is not a token and the Hedqvist[208] conclusions will apply. If the cryptocurrency has another purpose than a mere means of payment, it is suggested to apply the

204 *Granton Advertising* (n 79).

205 *Hedqvist* (n 1).

206 See *CPP* (n 91) and *Levob* (n 92).

207 *CPP* (n 92).

208 *Hedqvist* (n 1). para 54.

conclusions from section 2.2 *How to Treat Alternative Cryptocurrencies for VAT Purposes* of this work.

If there is already an existing blockchain and the token is based on it, it may be proceeded further. Tokens are usually created with intention of a provision of services or a granting of rights similar to shareholders´ rights. Provision of services for consideration by a taxable person falls into scope of VAT. A mere issue of shares is not an economic activity and does not fall within the scope of VAT[209].

If the token has the predominant character of service, it is necessary to distinguish whether it is possible at first to find out with certainty what specific service it is. Most commonly *utility tokens* at the time of issue do not specify the service provided, nor the price. No service is provided at the moment of the sale of the token. In this case, similar treatment is used as in the case of multipurpose vouchers. If the service is sufficiently specific, including the parties to the contract and the place of supply[210], the same approach as to a single-purpose voucher should be used. If the underlying service is provided to non-taxable person, as it is rendered in the online world by an automatic means, it will meet the criteria for the special regime of electronic service.

If the token has the predominant character of similar rights to a shareholders´, it is necessary to assess whether the security token confers similar rights as securities. The issue of such share-like tokens does not fall within the scope of VAT, because it does not constitute an economic activity. The tokens are usually intended for trading. The following answer regarding the tax treatment of trading of security tokens is, the transactions are exempted under Article 135(1) (f) of the Directive.

209 *Kretztechnik* (n 200).

210 *BUPA Hospitals Ltd* (n 194).

Unfortunately, this is certainly not an exhaustive list of VAT treatment rules for the token. At this point, there are more than 690 launched ICO projects[211]. It is certain that some of their tokens mix a lot of different supplies together or even do not provide any services at all.

211 'Coinschedule - Cryptocurrency ICO Statistics' (*coinschedule.com*) <https://www.coinschedule.com/stats.html> accessed 10 June 2018.

5 Regulatory Recommendations

5.1 Exchange

It is obvious that due to the high numbers of new cryptocurrencies and their various uses, the conclusion of the Hedqvist case[212] is not suitable for many of them. As for the transactions of exchange, issue and transfer of cryptocurrencies the most suitable solution seems to expressively exempt such transactions.

In line with the sense of taxation of consumption, there is no consumable service provided in any moment of transactions concerning exchange of cryptocurrencies. All the arguments leading to the exemption in case of financial services are well applicable to the case of cryptocurrencies. It may be argued financial services should be taxed as well. On the other hand, in case of cryptocurrencies, they are just instruments used for purchase of fully taxable goods or services[213]. Likewise the legal certainty about transactions concerning cryptocurrencies with not only the one purpose of a means of payment, would be greatly improved.

5.2 Mining

As mentioned above, the mining of cryptocurrencies occurs most often by verifying transactions within the blockchain ledger. As suggested above, it would be appropriate to exempt transfer or issue of virtual currencies.

212 *Hedqvist* (n 1). Transactions involving non-traditional currencies in so far as those currencies have been accepted by the parties to a transaction as an alternative to legal tender and have no purpose other than to be a means of payment, are financial transactions.

213 See i.e. Harry Grubert and James Mackie, 'Must Financial Services Be Taxed under a Consumption Tax?' (2000) 53 National Tax Journal; Washington 23.

If the link between activity of miner and the received remuneration is sufficient, the mining would be exempted as a transaction concerning transfers or issue of a new cryptocurrency. Therefore both problems with setting the tax base and compliance costs diminish.

The distinguishing criterion of the exemption would still be the same as in the case Sparekassernes Datacenter. In order to be characterized as an exempt transaction, the transaction must have the effect of transferring funds and entails changes in the legal and financial situation. This service must be distinguished from a mere physical or technical supply, such as provision of mere computer power[214].

5.3 Tokens

Tokens meet the undermentioned definition of a virtual currency. They are a digital representation of value and are not issued by a bank or public authority. As the issue of virtual currency in general would be exempted, ICOs fall under the exemption as well.

The subsequent provision of services or the sale of the goods would subsequently be taxed under the current rules, as only the issue of the virtual currency is exempted, not the provision of the services themselves.

5.4 Changes to the Directive

Law has always been catching up with reality[215]. In the case of VAT, we have a specially regulated exception of exemption for the marginality as is hire of safes. But transactions with cryptocurrencies and tokens are not explicitly regulated.

The wording of exemption proposed may be:

Member States shall exempt the following transactions:

214 *Sparekassernes Datacenter* (n 84). para 66.

215 See i.e. LL Fuller, 'American Legal Realism' (1934) 82 University of Pennsylvania Law Review and American Law Register 429.

(d) transactions, including negotiation, concerning deposit and current accounts, payments, transfers, debts, cheques and other negotiable instruments, **transfers or issue of virtual currencies,** but excluding debt collection;

(x) transactions, including negotiation, concerning virtual currency used as a means of exchange.

The definition of virtual currency or cryptocurrency is not necessary to be explicitly written. The VAT system is autonomous and all the definitions as well. Furthermore, cryptocurrencies are defined in the fifth AML directive[216], whereas 'virtual currencies' means a digital representation of value that is *not* issued *or guaranteed* by a central bank or a public authority, *is not* necessarily attached to a *legally established* currency *and does not possess a legal status of currency or money*, but is accepted by natural or legal persons as a means of *exchange* and *which* can be transferred, stored *and* traded electronically.

216 'Texts Adopted - Thursday, 19 April 2018 - Prevention of the Use of the Financial System for the Purposes of Money Laundering or Terrorist Financing ***I - P8_TA-PROV(2018)0178' (n 3).

6 Conclusion

In the case of cryptocurrencies, it turns out that the technologies are multiple times faster than the law. There is still no single opinion on Bitcoin mining, and there are already more than 1,600 virtual currencies, with the VAT regulatory response being scarce.

The VAT treatment of Bitcoin regarding the exchange of traditional currencies for Bitcoin is a relatively well-resolved issue thanks to the Hedqvist case. A mere exchange of a Bitcoin for a traditional currency without any consideration is not a taxable supply and is not subject to VAT. Furthermore, the *Article 135(1)(e) of Directive 2006/112 must be interpreted as meaning that the supply of services, which consist of the exchange of traditional currencies for units of the 'bitcoin' virtual currency and vice versa, performed in return for payment of a sum equal to the difference between, on the one hand, the price paid by the operator to purchase the currency and, on the other hand, the price at which he sells that currency to his clients, are transactions exempt from VAT, within the meaning of that provision*. This conclusion is unfortunately not applicable if the alternative cryptocurrency has other purposes than a means of payment. For example, the aforementioned Ripple seems to have only that purpose. If the only purpose is not to be a means of payment, one must assess whether there is a reason for exemption based on classification of the cryptocurrency as a negotiable instrument such as Ethereum. If there is no reason to classify as a negotiable instrument or a security, such a transaction may be classified as an electronic service (in B2C relationships) or a standard service (in B2B relationships).

As far as mining of cryptocurrencies is concerned, it is stated that due to a lack of link between activity and consideration, mining is outside the scope of VAT. In this work, however, it has been demonstrated that the systems governing the distribution of mining pools' remuneration ensure a reduction in uncertainty as for the remuneration received, and allowing a precise prediction of the remuneration depending on the computed performance. In this case, the activity can be qualified as having sufficient link to the consideration. The full node (a sole

miner or a mining pool entity) of the blockchain protocol provides the service of verification of transactions and controls the process of such verification. A member of mining pool has no control over verification of the whole block and has only a contractual relationship with the full node which distributes the remuneration. The member of the pool provides only the computational power of the hardware and in fact is not in control of the verification process. Therefore in line with the presented case law, the classification of transactions of mining in a pool shall be non-exempt from VAT. The activity of mining pool itself consisting of the mining of a new cryptocurrency will fall outside the scope of VAT or, if the direct link between activity and the consideration in specific cases is established, provides an exempt transaction under Article 135(1)(d) of the Directive. The activity of mining pool consisting of accepting fees from members of the mining pool for pool-related services fall within the scope of VAT and is a necessary part of the process of verifying transactions within a blockchain, thus also exempted under Article 135(1)(d) of the Directive.

The issue of ICOs is particularly interesting in view of the high volumes of funds that are concentrated in this specific crowdfunding mode. Tokens as such do not meet the criteria set forth in the Hedqvist case. In particular, it is necessary to distinguish the case of the security tokens and the utility tokens. In the first case, it is necessary to determine if the services provided are sufficiently specific at the time of the token issue. If not, it may be treated in analogy to multi-purpose vouchers. In the latter case, if it is a token incorporating rights similar to those of a business corporation partner, such a transaction consisting of transfer of such rights as exempt under Article 135 (1) (f) of the Directive.

As far as regulatory recommendations are concerned, it seems useful to explicitly exempt transfers or issue of virtual currencies. In view of possible problems with virtual currencies that do not only serve as a means of payment, it would be appropriate to exempt transactions, including negotiation, concerning virtual currency used as a means of exchange. Tokens meet the above definition of virtual currency, so their transfer and issue would be exempted. This does

not affect the tax regime of the underlying service or any other supply, which would be taxed normally.

Given the rapid development of virtual currencies and past failures to change the tax regime for financial services, it is hardly possible to expect a rapid legislative response. Instead, it can be expected that the CJEU will seek to interpret the nature of the cryptocurrency transactions in the direction outlined in Hedqvist case, rather similar to traditional currencies.

Bibliography

'About LocalBitcoins.Com' <https://localbitcoins.com/about> accessed 10 June 2018

Adhami S, Giudici G and Martinazzi S, 'Why Do Businesses Go Crypto? An Empirical Analysis of Initial Coin Offerings' (Social Science Research Network 2018) SSRN Scholarly Paper ID 3046209 <https://papers.ssrn.com/abstract=3046209> accessed 6 June 2018

Bal A, 'VAT Treatment of Initial Coin Offerings' 2018

Bambara J and Allen P, *Blockchain. A Practical Guide to Developing Business, Law, and Technology Solutions.*

Bashir I, *Mastering Blockchain: Deeper Insights into Decentralization, Cryptography, Bitcoin, and Popular Blockchain Frameworks* (Packt Publishing - ebooks Account 2017)

Baur DG and Dimpfl T, 'Excess Volatility as an Impediment for a Digital Currency' (Social Science Research Network 2018) SSRN Scholarly Paper ID 2949754 <https://papers.ssrn.com/abstract=2949754> accessed 9 June 2018

Bentov I and others, 'Proof of Activity: Extending Bitcoin's Proof of Work via Proof of Stake [Extended Abstract]Y' (2014) 42 SIGMETRICS Perform. Eval. Rev. 34

Bentov I, Gabizon A and Mizrahi A, 'Cryptocurrencies Without Proof of Work', *Financial Cryptography and Data Security* (Springer, Berlin, Heidelberg 2016) <https://link.springer.com/chapter/10.1007/978-3-662-53357-4_10> accessed 10 June 2018

'Bitcoin Block Explorer - BTC.Com' <https://btc.com/> accessed 10 June 2018

'Bitcoin Energy Consumption Index' (*Digiconomist*) <https://digiconomist.net/bitcoin-energy-consumption> accessed 10 June 2018

Buterin V, 'Ethereum: A Next-Generation Cryptocurrency and Decentralized Application Platform' (*Bitcoin Magazine*) <https://bitcoinmagazine.com/articles/ethereum-next-generation-cryptocurrency-decentralized-application-platform-1390528211/> accessed 10 June 2018

'Buy Bitcoins Online or with Cash - Fast and Easy' <https://localbitcoins.com/buy_bitcoins> accessed 10 June 2018

CFA (ICFAI) PB, 'Ethereum' (*Investopedia*, 24 February 2016) <https://www.investopedia.com/terms/e/ethereum.asp> accessed 6 June 2018

'Coinschedule - Cryptocurrency ICO Statistics' (*coinschedule.com*) <https://www.coinschedule.com/stats.html> accessed 10 June 2018

'Comparison of Mining Pools - Bitcoin Wiki' <https://en.bitcoin.it/wiki/Comparison_of_mining_pools> accessed 10 June 2018

'Cryptocurrency Market Capitalizations | CoinMarketCap' <https://coinmarketcap.com/> accessed 6 June 2018

'Energy Consumption in the Netherlands' (*Worlddata.info*) <https://www.worlddata.info/europe/netherlands/energy-consumption.php> accessed 10 June 2018

'EOSIO Developer Portal - EOSIO Development Documentation' <https://developers.eos.io/> accessed 10 June 2018

'EY Research: Initial Coin Offerings (ICOs)' <http://www.ey.com/Publication/vwLUAssets/ey-research-initial-coin-offerings-icos/$File/ey-research-initial-coin-offerings-icos.pdf>

Fuller LL, 'American Legal Realism' (1934) 82 University of Pennsylvania Law Review and American Law Register 429

Glazer P, 'An Explanation of Cryptocurrency Forks' (*Hacker Noon*, 11 February 2018) <https://hackernoon.com/an-explanation-of-cryptocurrency-forks-65d79efe214c> accessed 15 June 2018

Grubert H and Mackie J, 'Must Financial Services Be Taxed under a Consumption Tax?' (2000) 53 National Tax Journal; Washington 23

Hanych M, 'Taxation of Cryptocurrencies' 2018 eBulletin of the Czech Chamber of Tax Advisers

Hanych M, 'VAT Treatment of Tokens and Mining' 2018 eBulletin of the Czech Chamber of Tax Advisers

'Homepage' (*slushpool.com*) <https://slushpool.com/home/> accessed 6 June 2018

Inc TTP, 'Tor Project | Privacy Online' <https://www.torproject.org/> accessed 9 June 2018

Kariuki D, 'Alternatives to Proof of Work' (*Cryptomorrow - Cryptocurrency, Bitcoin, Ethereum*, 28 August 2017) <http://www.cryptomorrow.com/2017/08/28/alternatives-to-proof-of-work/> accessed 10 June 2018

King S and Nadal S, 'Ppcoin: Peer-to-Peer Crypto-Currency with Proof-of-Stake' <https://pdfs.semanticscholar.org/0db3/8d32069f3341d34c35085dc009a85ba13c13.pdf>

Madeleine M, 'The VAT Consequences of Crowdfunding' (Social Science Research Network 2016) SSRN Scholarly Paper ID 3112131 <https://papers.ssrn.com/abstract=3112131> accessed 16 June 2018

Martin J, *The Beginner's Guide to The Internet Underground* (2015) <https://s3.amazonaws.com/storage.pardot.com/12882/90732/The_Beginners_Guide_to_The_Internet_Underground.pdf>

'Mining Profitability - What Is Pool Hopping?' (*Bitcoin Stack Exchange*) <https://bitcoin.stackexchange.com/questions/5072/what-is-pool-hopping?

utm_medium=organic&utm_source=google_rich_qa&utm_campaign=google_rich_qa> accessed 10 June 2018

Momoh O, 'Initial Coin Offering (ICO)' (*Investopedia*, 20 December 2016) <https://www.investopedia.com/terms/i/initial-coin-offering-ico.asp> accessed 6 June 2018

Nakamoto S, 'Bitcoin: A Peer-to-Peer Electronic Cash System' <https://bitcoin.org/bitcoin.pdf>

Norta A, 'Creation of Smart-Contracting Collaborations for Decentralized Autonomous Organizations' (2015)

'Proof of Burn - Bitcoin Wiki' <https://en.bitcoin.it/wiki/Proof_of_burn> accessed 6 June 2018

'Proposal for a Council Directive Amending Directive 2006/112/EC on the Common System of Value Added Tax, as Regards the Treatment of Insurance and Financial Services, A6-0344/2008', <http://www.europarl.europa.eu/sides/getDoc.do?type=REPORT&reference=A6-2008-0344&language=EN>

'Revenue and Customs Brief 9 (2014): Bitcoin and Other Cryptocurrencies' (*GOV.UK*) <https://www.gov.uk/government/publications/revenue-and-customs-brief-9-2014-bitcoin-and-other-cryptocurrencies/revenue-and-customs-brief-9-2014-bitcoin-and-other-cryptocurrencies> accessed 6 June 2018

'Ripple' (*GitHub*) <https://github.com/ripple> accessed 9 June 2018

'Ripple's Distributed Ledger Network Passes 50-Validator Milestone' (*CoinDesk*, 17 July 2017) <https://www.coindesk.com/ripples-distributed-ledger-network-passes-50-validator-milestone/> accessed 9 June 2018

'Satoshi 's Fortune: A More Accurate Figure' (*Bitslog*, 24 April 2013) <https://bitslog.wordpress.com/2013/04/24/satoshi-s-fortune-a-more-accurate-figure/> accessed 10 June 2018

Savelyev A, 'Contract Law 2.0: "Smart" Contracts as the Beginning of the End of Classic Contract Law' (2017) 26 Information & Communications Technology Law 116

Schwartz D, Youngs N and Britto A, 'The Ripple Protocol Consensus Algorithm' <https://ripple.com/files/ripple_consensus_whitepaper.pdf>

Sedgwick K, 'Verge Is Forced to Fork After Suffering a 51% Attack' (*Bitcoin News*, 5 April 2018) <https://news.bitcoin.com/verge-is-forced-to-fork-after-suffering-a-51-attack/> accessed 10 June 2018

Shirriff K, 'Hidden Surprises in the Bitcoin Blockchain and How They Are Stored: Nelson Mandela, Wikileaks, Photos, and Python Software' <http://www.righto.com/2014/02/ascii-bernanke-wikileaks-photographs.html> accessed 6 June 2018

Slimcoin: SLIMCoin Official Repository (The Slimcoin Project 2018) <https://github.com/slimcoin-project/Slimcoin> accessed 6 June 2018

Terra B and Kajus J, *Introduction to European VAT (Recast)* (IBFD 2017)

Terra B and Kajus J, *Guide to the Recast VAT Directive*, vol 2017 (IBFD)

'Texts Adopted - Thursday, 19 April 2018 - Prevention of the Use of the Financial System for the Purposes of Money Laundering or Terrorist Financing ***I - P8_TA-PROV(2018)0178' <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P8-TA-2018-0178&format=XML&language=EN#BKMD-6> accessed 10 June 2018

'Token. All about Cryptocurrency - Bitcoin Wiki' <https://en.bitcoinwiki.org/wiki/Token> accessed 9 June 2018

'Transaction Cost - XRP Ledger Dev Portal' <https://developers.ripple.com/transaction-cost.html> accessed 9 June 2018

'TRON | Decentralize The Web' <https://tron.network/index?lng=en> accessed 10 June 2018

'Umsatzsteuerliche Behandlung von Bitcoin und anderen sog. virtuellen Währungen' 4

van Brederode R and Krever R, 'Theories of Consumption and the Consequences of Partial Taxation of Financial Services', *VAT and Financial Services: Comparative Law and Economic Perspectives* (2017)

VAT Committee, 'Working Paper No. 811' <https://circabc.europa.eu/sd/a/4adc83f8-a7ab-48ee-b907-468459c0dad7/49%20-%20VAT%20treatment%20of%20Bitcoin.pdf>

VAT Committee, 'Working Paper No. 854' <https://circabc.europa.eu/sd/a/19f564ce-3878-4a61-9b8c-fodbf545465f/854%20-%20Commission%20-%20VAT%20treatment%20of%20Bitcoin%20(II).pdf>

VAT Committee, 'Working Paper No. 892' <https://circabc.europa.eu/sd/a/19f564ce-3878-4a61-9b8c-fodbf545465f/854%20-%20Commission%20-%20VAT%20treatment%20of%20Bitcoin%20(II).pdf>

Weiser B, 'Man behind Silk Road Website Is Convicted on All Counts' [2015] New York Times <https://www.nytimes.com/2015/02/05/nyregion/man-behind-silk-road-website-is-convicted-on-all-counts.html>

'What Is PPLNS» Give Me' <http://give-me-coins.com/support/faq/what-is-ppln s/> accessed 6 June 2018

Wiki: The Ethereum Wiki (ethereum 2018) <https://github.com/ethereum/wiki> accessed 9 June 2018

Wolf RA, 'Bitcoin and EU VAT' [2014] International VAT Monitor

Wolf RA, 'Virtual Currencies, M-Payments and VAT: Ready for the Future?', *Bitcoin and Mobile Payments* (Springer 2016)

WOOD DG, 'Ethereum: A Secure Decentralised Generalised Taransaction Ledger' <http://gavwood.com/Paper.pdf>

Case law

Apple and Pear Development Council ECJ 102/86

AXA UK CJEU C-175/09

Axel Kittel CJEU C-439/04

Baštová CJEU C-432/15

Becker CJEU C-104/12

Bookit CJEU C-607/14

BUPA Hospitals Ltd CJEU C-419/02

Český rozhlas CJEU C-11/15

Coöperatieve Aardappelenbewaarplaats CJEU C-154/80

CPP CJEU C-349/96

Einberger I CJEU C-240/81

First National Bank of Chicago CJEU C-172/96

Fisher CJEU C-283/95

Granton Advertising CJEU C-461/12

Halifax CJEU C-255/02

Happy Family CJEU C-461/12

Hedqvist CJEU C-264/14

Hong Kong Trade CJEU C-89/81

INZO CJEU C-110/94

KapHag CJEU C-442/01

Kennemer Golf CJEU C-174/00

Kretztechnik CJEU C-465/03

Lajvér CJEU C-263/15

Le Rayon d'Or CJEU C-151/13

Levob CJEU C-41/04

Ludwig CJEU C-453/05

National Exhibition Centre CJEU C-130/15

Opinion of AG Saugmandsgaard Øe in DPAS Limited CJEU C-5/17

Polysar CJEU C-60/90

Rompelman CJEU C-268/83

Skandinaviska Enskilda Banken CJEU C-540/09

Sparekassernes Datacenter CJEU C-2/95

Tolsma CJEU C-16/93

Velvet & Steel Immobilien CJEU C-455/05

Wellcome Trust CJEU C-155/94

Witzemann CJEU C-343/89

District Court in Łódź, Poland I SA/Łd 54/16