Crypto-assets: Commodities under European financial markets law?

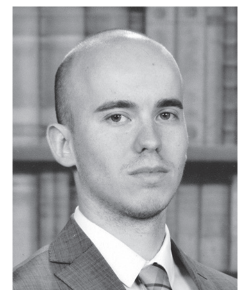
Ralph Rirsch* and Stefan Tomanek**

Received (in revised form): 14th November, 2018

*Integrated Conduct Supervision of Banks, Austrian Financial Market Authority (FMA),
Otto-Wagner-Platz 5, A-1090 Vienna, Austria
Tel: +43 (0)1 249 59-4312; E-mail: ralph.rirsch@fma.gv.at

**Prudential Supervision Asset Management, Prospectus, Consumer Information,
Austrian Financial Market Authority (FMA), Otto-Wagner-Platz 5, A-1090 Vienna, Austria
Tel: +43 (0)1 249 59-3412; E-mail: Stefan.Tomanek@fma.gv.at

Ralph Rirsch



Stefan Tomanek

Ralph Rirsch *is a supervisor at the Austrian Financial Market Authority in the Department for Integrated Conduct Supervision of Banks. He is specialised in the PRIIPs-regulation (packaged retail and insurance-based investment products) and new technologies. Before his time at the FMA, he worked as a consultant in the Austrian banking sector with a focus on regulatory issues (eg, MIFID II, PSD2 [Markets in Financial Instruments Directive II, Payment Services Directive 2]), large-scale IT-implementations and database management. Additionally, he was active as a freelance systemic consultant for SMEs (small and medium enterprises), specialising in group dynamics. His academic background is in law (University of Vienna) and international business administration (Vienna University of Economics and Business).*

Stefan Tomanek *is a legal expert in the Department for Prudential Supervision Asset Management, Prospectus, Consumer Information at the Austrian Financial Market Authority (FMA). While the supervision of UCITs and AIFs (undertakings for the collective investment in transferable securities and alternative investment funds) is the main focus of his work, he is heavily involved in the area of crypto-assets and related business models. In this context, he is also a delegate in international committees as well as ESMA (European Securities and Markets Authority) committees. Prior to his work at the Financial Market Authority he has gained experience in a legal and compliance department of a large Austrian bank. He holds a master's degree in law from the University of Vienna.*

Abstract

This paper sheds light on the legal nature of crypto-assets in capital markets law. There is currently no generally accepted legal definition of the terms 'crypto–assets' or 'cryptocurrency' aside from the term 'virtual currency' in the 5th Anti-Money Laundering Directive. While it is clear that crypto-assets performing payment functionalities are not considered legal tender in the sense of government sanctioned currencies, the question remains whether or not crypto-assets should be considered goods in the context of the European fundamental freedoms and/or commodities in the sense of European capital markets law. This classification, however, bears significant ramifications in various legal areas that are explored in this paper. It will be shown that crypto-assets are goods subject to the freedom of movement of goods guaranteed by articles 28 to 37 TFEU (Treaty on the Functioning of the European Union). On the other hand the authors propose that crypto-assets should not be considered to fall within the definition of commodities as used in capital markets law (eg, MIFID [Markets in Financial Instruments Directive] I and II, Benchmark-Regulation, etc) and are therefore not subject to the regulatory consequences of this qualification, such as potential regulation of market places as commodity exchanges or regulatory reporting obligations related to commodity derivatives.

Journal of Financial Compliance
Vol. 2, No. 3 2019, pp. 199–206
© Henry Stewart Publications,
2398-8053

Keywords: crypto-asset, cryptocurrency, freedom of movement of goods, freedom of movement of capital, commodity; MIFID (Markets in Financial Instruments Directive)

INTRODUCTION

The umbrella term 'crypto-assets' (which, *inter alia*, includes cryptocurrencies such as Bitcoin & Co.) is currently not legally defined in most of European capital markets law. The definition of the term 'virtual currency' in the 5th Anti-Money-Laundering-Directive[1] is the only notable exception to this lack of definition of terms. Consequently, there is considerable legal uncertainty in the market. One of the few broadly accepted views in this regard is that crypto-assets are not considered as 'traditional' legal tender — equivalent to say the euro or the British pound.[2] Another equally fundamental question remains without a satisfactory answer, however, namely whether or not crypto-assets should be considered as 'goods' as defined in the European freedom of movement of goods according to Articles 28–37 TFEU (Treaty on the Functioning of the European Union) and/or 'commodities' under capital markets law (MIFID (Markets in Financial Instruments Directive) I & II). This classification has a significant impact on the financial and legal nature of crypto-assets and therefore warrants a detailed legal analysis. We propose that these terms are neither mutually exclusive nor identical. The same object can be identified as a good, but not a commodity. This distinction is central to the proper legal treatment of crypto-assets. Goods, in the sense of Articles 28–37 TFEU, are afforded the fundamental protection of the freedom of movement of goods. The classification of crypto-assets as commodities on the other hand, entails serious consequences in European capital markets law and does not do sufficient justice to the basic idea of the MIFID-term 'commodity', as the inclusion of entirely intangible goods was never intended and is even explicitly ruled out.[3]

Due to the diversity of options in the design and technical implementation of crypto-assets, this paper will concentrate predominantly on traditional cryptocurrencies, such as Bitcoin, Dash or Litecoin. These cryptocurrencies all aim to create an alternative peer-to-peer payment system.[4] A detailed analysis of the technical workings of such crypto-assets has already been conducted elsewhere and is therefore omitted.[5]

POTENTIAL IMPACT OF THE CLASSIFICATION AS A COMMODITY IN EUROPEAN CAPITAL MARKETS LAW

At the time of writing, the debate about the potential classification of some crypto-assets as securities in European financial markets law is still ongoing. A classification as commodities, however, would have severe implications for crypto-assets. For instance, it would rule out the possibility of crypto-assets being classified as securities because a commodity cannot at the same time be a security and vice versa. This means that even such crypto-assets (and in particular investment services performed in connection with them) that explicitly aim to mimic traditional securities would not be regulated by European securities law (eg, MIFID II) and instead would remain mainly unregulated. Such unequal treatment of crypto-assets and the very securities they are trying to emulate on the Blockchain (eg, in the case of shares and tokenised shares — the former being a security, the latter being treated as a commodity) seems unjustified and potentially gives rise to a number of issues such as the possibility of circumvention of securities law by using crypto-assets instead of traditional securities.

Following this train of thought, crypto trading venues would be classified as commodity exchanges. Depending on national

legislation, as for example in Austria, this may lead to such venues not falling under the rules for regulated markets, multilateral trading facilities (MTFs) or organised trading facilities (OTFs) set forth in MIFID II. As a result, there would be no consistent level of protection for investors exposed to risks that are either comparable to, or even greater than those encountered on traditional trading venues.

As another direct consequence of the classification of crypto-assets as commodities, derivatives based on crypto-assets would constitute commodity derivatives according to Article 4(1) No. 50 MIFID II in conjunction with Article 2(1) No. 30 MIFIR (Markets in Financial Instruments Regulation). Offering such commodity derivatives for sale requires a licence under MIFID II. Additionally, the entire commodity derivatives regime of MIFID II (eg, Article 58 MIFID II) would be applicable to both venues trading in these derivatives (unlike venues trading in the underlying crypto-asset as discussed above) and firms trading such derivatives OTC (over-the-counter). One of the many costly and work-intensive requirements of the regime is for trading venues to track and report their own position on a daily basis, and more problematically the positions of their clients and their clients in turn up to the ultimate holder of the position. This would cause both high costs and potential liquidity issues for a nascent market where many trading venues are small-scale businesses that do not possess the extensive infrastructure required to satisfy these requirements.

One final consequence of the classification of crypto-assets as commodities that must be highlighted is that benchmarks based on crypto-assets would qualify as commodity benchmarks according to the Benchmark Regulation. Such commodity benchmarks are subject to a different licensing regime to benchmarks based on, for example, transaction data or interest rate indicators. According to Article 19 of the Benchmark Regulation they are also less strictly regulated. Under certain circumstances (see Article 2(2) lit g) some commodity benchmarks might even be fully exempt from the regulation. Such exceptions are not made for benchmarks based on securities.

CRYPTO-ASSETS AS GOODS UNDER THE PROTECTION OF THE FREEDOM OF MOVEMENT OF GOODS

Based on the definition of 'virtual currencies' in the newly added Article 3 (18) of the 5th Anti-Money-Laundering Directive (5th AMLD) it is possible to argue that crypto-assets are not 'capital' in the sense of the freedom of movement of capital. This definition goes:

> 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;[6]

In contrast to the initial draft of the directive[7] the term 'means of payment' has been replaced with 'means of exchange'. Taking this in isolation one could come to the conclusion that the legislator no longer considers crypto-assets as a means of payment.[8] Instead, this perspective considers crypto-assets as goods that can be produced and used as a means of exchange like other goods. Evaluating these two positions one however has to take into account the relevant recitals of the regulation. In this case, Recital 10 explicitly shows that the regulator still considers crypto-assets as a means of payment — the idea driving the change in wording was simply to broaden the scope of the regulation:

> Although virtual currencies can frequently be used as a means of payment, they could also be used for other purposes and find broader applications such as means of exchange, investment, store-of-value products or use in online casinos. The objective of this Directive is to cover all the potential uses of virtual currencies.[9]

Based on this recital, we think that it goes too far to conclude that the European legislator no longer considers crypto-assets a means of payment, which for traditional cryptocurrencies such as Bitcoin, constitutes their main purpose as peer-to-peer payment networks aside from their use as a store of value. Nevertheless, we agree that crypto-assets do not have the same legal status as legal tender[10] and should thus be considered as 'goods' rather than 'capital' in the context of the European fundamental freedoms of movement of goods or movement of capital, especially due to their mostly private nature and origin. It is irrelevant for the classification of crypto-assets as goods whether or not one considers crypto-assets as a means of payment, since they are *de jure* not legal tender, and the freedom of movement of capital only applies to legal tender.[11] Crypto-assets, however, are private and entirely intangible goods as illustrated below, and are therefore protected by the freedom of movement of goods.

Differences in the interpretation of the 5th AMLD therefore do not have an impact on the result of this legal analysis. It should, however, be noted that such differences in interpretation may have serious effects on the discourse in other fields, such as the determination of whether mining of crypto-assets constitutes a financial service and given a fund-like structure of the business model thereby a potential (assessed on a case-by-case basis) use-case of the Directive on Alternative Investment Fund Managers.[12]

The apparent contradiction between the classification of crypto-assets as goods in the sense of the fundamental European freedoms on the one hand, and their use as means of payment (in the case of traditional cryptocurrencies) on the other hand, can be resolved by considering the knowledge and goals of legislators at the time of the inception of the European rules on movement of capital. At that time, these rules were meant to cover centrally administrated national currencies as well as e-cash,[13] as put simply, no other phenomena sharing the same characteristics and therefore requiring regulation existed. The legislator was not in a position to foresee the rise of crypto-assets — privately created goods that derive their value not from an obligation by the issuer and compulsory acceptance by private individuals, but exclusively from the collective perception of value by an unregulated community of private individuals. Legislators were in even less of a position to predict that such a phenomenon would gain widespread acceptance in economic life. It therefore falls to the European legislator to decide whether crypto-assets as alternative means of payment should continue to be treated differently from traditional currencies or whether a change in regulation is required. On the basis of the facts as they stand, however, no legal argument comes to mind as to why crypto-assets should not be considered goods protected by the freedom of movement.

CRYPTO-ASSETS ARE NOT COMMODITIES UNDER EUROPEAN CAPITAL MARKETS LAW

The term 'commodity' is defined in MIFID I[14] and II[15] as well as MIFIR[16] and has to be interpreted independently and without regard to the analysis above — as is explicitly stated in Recital 24 of Regulation 1287/2006/EC,[17] an implementing regulation for MIFID I, which is still in force, as the Benchmark Regulation and the Prospectus Regulation refer to it. Annex I Part

C Points 5–7 of MIFID II contain a list of financial instruments that are based on 'commodities' as underlyings — so-called commodity derivatives. The term 'commodity' is defined in Art. 2 (6) of Commission Delegated Regulation 2017/565/EU:[18]

> 'commodity' means any goods of a fungible nature that are capable of being delivered, including metals and their ores and alloys, agricultural products, and energy such as electricity.

Annex I Part C No. 10 of MIFID II contains an exhaustive list of other underlyings that do not satisfy the criteria above and are thus not considered commodities, but according to Article 2(1) (30) MIFIR still lead to derivatives based on them as underlyings being treated as commodity derivatives. This list contains climatic variables, freight rates, inflation rates or other official economic statistics, assets, rights, obligations and indices. It also includes 'measures not otherwise mentioned in this Section, which have the characteristics of other derivative financial instruments, having regard to whether, inter alia, they are traded on a regulated market, OTF, or an MTF'.[19] This means that in the event that a crypto-asset constitutes a derivative and is in turn used as an underlying, the derivative based on it could potentially be considered a commodity derivative. At the time of writing, however, the authors are not aware of crypto-assets that constitute derivatives, and much less derivatives that are traded on regulated markets, OTFs or MTFs (while crypto trading venues are broadly considered part of the financial or capital markets according to MIFID II[20] there is currently no regulated market in the EU that trades in crypto-derivatives).

Crypto-assets are neither part of the exhaustive list of Annex I Part C Nos. 5–7 and 10 of MIFID II nor do they fulfil the criteria of No. 10 for other measures not listed in the Annex. The only possibility left to potentially arrive at the conclusion that crypto-assets are commodities thus lies in the definition provided in Article 2 (6) of Commission Delegated Regulation 2017/565/EU. Taking a look at the various goods listed in the definition, however, it becomes clear that it is intended to cover physical goods only. Metals, ores, alloys, agricultural products and energy are all physical goods that can be physically delivered. The rationale that only physical goods should be covered by the term 'commodity' is also apparent in Recital 125 of MIFID II. It specifies that one of the goals of the regulation of commodity derivatives is to address excessive commodity price volatility, focusing on the European food supply chain and raw materials. Recital 26 of Regulation 1287/2006/EC even explicitly states that 'the concept of commodity should not include services or other items that are not goods, such as currencies or rights in real estate, or that are entirely intangible.'[21] Crypto-assets do not have a physical representation of any form. They exist solely as data on the distributed ledger. Even so-called 'physical wallets' are not physical representations of the crypto-assets 'stored' in the wallet. Such wallets are merely physical devices to store the keys (private and public) required to secure access to the Blockchain. Crypto-assets cannot exist or be stored outside their native Blockchain. This is technically impossible in all major crypto-assets and would violate the fundamental principle of distributed storage underlying the distributed ledger technology. Consequently, crypto-assets are entirely intangible goods and cannot be classified as commodities according to Article 2 (6) of Delegated Regulation 2017/565/EU or Article 2(1) of Regulation 1287/2006/EC.

Another argument supporting this result stems from the technical design of many crypto-assets such as Bitcoin, Ethereum and Ripple. These crypto-assets, as many others, are based on the principle of the traceability

of transactions. This means that down to the smallest increment, that is, unit of accounting of the crypto-asset, each unit can be traced back to the point of its creation. Using the example of Bitcoin, this means that every single Satoshi (the smallest accounting unit in the Bitcoin network) can be traced back to the transaction it originated from via an unbroken chain of transactions. This chain of transactions is one of the basic ideas behind the Blockchain technology. Additionally, in a technical sense there is no 'Bitcoin' as a uniform and consistent entity. Rather, the holder of the private key has the right to use the outputs of transactions received as inputs to fund outgoing transactions. 'Bitcoin' is an accounting unit. The inputs are merely denominated in Bitcoin (more correctly Satoshis) — however, a transaction of '1 Bitcoin' can consist of many different inputs. These inputs are traceable and every single one has its own unique transaction history. Due to this, inputs on the Bitcoin Blockchain are not freely interchangeable with other inputs of the same amount of Satoshis. The impact of this transaction history is already being felt in the community. Some market players, mostly crypto trading venues, have put rules and systems in place to reject so called 'tainted' transactions.[22] Tainted transactions are based on inputs that have been linked to criminal activity, such as black market/darknet transactions, hacked wallets or the infamous WannaCry[23] scheme.

We therefore argue that crypto-assets are not 'goods of fungible nature' and thus not commodities, since fungibility means interchangeability and units of crypto-assets that provide a traceable transaction history (which is still the case with 'privacy' coins such as Monero) are not interchangeable. To illustrate this point, a barrel of crude oil of a specific type is always interchangeable with another barrel of the same type — which is not the case for inputs in the Bitcoin network due to their transaction history and potential limitations in tradability resulting from it.

Another perspective on this issue is to interpret fungibility as 'tradability' and to disregard the individuality of inputs as long as they are factually interchangeable in the course of business. In this case fungibility is only sufficiently impaired to deny it outright if enough units of a crypto-asset are 'tainted' to actually obstruct trade in the crypto-asset as a whole. Where this threshold lies and whether it has already been reached for some crypto-assets (mainly Bitcoin) is a point open for discussion.

One could further argue that restrictions to the fungibility (in the sense of tradability) of specific units (eg, inputs in Bitcoin) of a crypto-asset, based on the individual history of this unit — for instance, because it was used to fund an illicit transaction — does not impair the fungibility of the crypto-assets of the network as a whole, but creates a new 'class' of non-fungible units in the network. In this line of thinking the tainted units are assessed separately from the untainted units, thereby not impairing the fungibility of the untainted rest, similar to a rotten apple not making all apples of the same type non-interchangeable. Opposed to this view, we want to point out that there is a fundamental difference between subsequent changes or damage to a unit, for example an apple, and the case of crypto-assets where traceability and uniqueness are an inbuilt feature of the unit from its very inception. The mechanism of traceability is permanent and always active. It is also not limited to tracking 'taint', which is only one of its applications. Furthermore, unlike with bulk goods where some units are damaged, it is very simple for every user of the network to trace any transaction with relatively little effort. In most crypto-assets there are no access limitations to the ledger and algorithms are widely available for this purpose. Therefore, we argue that the idea of differentiating classes of crypto-assets within the same network

based on their transaction history is not a viable approach. This issue is aggravated by the fact that the evaluation of events in the transaction history, for example taint, is a matter of perspective (who decides what counts as tainted?) and gradual (a transaction can consist of both tainted and untainted inputs at the same time — thereby effectively mixing them and creating a 'muddled' taint in the output — creating nearly infinite, or as we argue, individual, 'levels' of taint). Thus, we propose that each unit of the crypto-assets in question is unique and therefore seriously doubt that crypto-assets with a transaction history as the one described can be seen as fully fungible.

CONCLUSION

The terms 'goods' and 'commodity' are used in different areas of law and encompass different legal consequences. Therefore they should be assessed independently from each other. A certain phenomenon can be a good protected by the freedom of movement of goods while not being a commodity according to EU financial market law, as is the case with the crypto-assets analysed in this paper. Especially for German speaking countries where the same word 'Ware' is used for both definitions, this differentiation may at first seem counterintuitive. It does, however, reflect the complex technical and financial realities of crypto-assets. Consequently, adequate protection is provided under the freedom of movement of goods while avoiding unnecessary and restrictive regulation in capital markets law. Aside from this legal classification, our analysis has shown that legal discourse regarding complex technical phenomena can only be successful if all the parties involved are fully aware of the meaning of the terms used. This is especially important in the kind of interdisciplinary and international work required to adequately address the global phenomenon of crypto-assets. The FCA (Financial Conduct Authority) has also identified this as an issue for investors in its qualitative consumer research targeted at UK customers, 'because of the language and images associated with crypto-assets (such as 'mining' and 'coins'), some respondents seemed to have a sense that they were investing in tangible assets.'[24] Therefore we would like to highlight the importance of investing the necessary time and effort to correctly and exhaustively ascertain the facts of the case, including a detailed technical analysis, and to create common linguistic grounds for all stakeholders, and especially legal practitioners involved in the crypto-economy, for example, by ways of legal disambiguation before engaging in detailed discussion or deciding on a case.

References

(1) Directive (EU) 2018/843 of the European Parliament and of the Council of 30th May, 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, and amending Directives 2009/138/EC and 2013/36/EU.

(2) See, for example, Point 2.13ff. of the Cryptoassets-Taskforce (2018) 'Cryptoassets Taskforce: Final report', HM Treasury, London, available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/752070/cryptoassets_taskforce_final_report_final_web.pdf (accessed 14th November, 2018).

(3) See: Recital 26 of Commission Regulation (EC) No 1287/2006.

(4) Nakamoto, S. (2008) 'Bitcoin: A peer-to-peer electronic cash system', available at: https://bitcoin.org/bitcoin.pdf (accessed 28th September, 2018); GitHub (2018) 'Dash: A privacy-centric crypto-currency', available at: https://github.com/dashpay/dash/wiki/Whitepaper (accessed 28th September, 2018); Litecoin 'Was ist Litecoin?', available at: https://litecoin.org/de/ (accessed 28th September, 2018).

(5) Tomanek, S., Rirsch, R. and Wintersberger, M., 'Crypto-mining business models — Points of contact to the AIFMD', *Journal of Digital Banking*, in press.

(6) Article 3, Par 18, of Directive (EU) 2018/843 of the European Parliament and of the Council of 30th May, 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist

financing, and amending Directives 2009/138/EC and 2013/36/EU).
(7) COM/2016/0450 final — 2016/0208 (COD), Proposal for a Directive of the European Parliament and of the Council amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing and amending Directive 2009/101/EC.
(8) Piska, C. and Völkel, O. (2018) 'Kryptowährungen und AML — Smart regulation in Sicht', *ecolex*,, Manz Verlag, Wien, Vienna.
(9) Recital 10 of Directive (EU) 2018/843 of the European Parliament and of the Council of 30th May, 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, and amending Directives 2009/138/EC and 2013/36/EU).
(10) The Austrian Financial Market Authority also shares this view: 'FMA focus on Bitcoin & Co', available at: https://www.fma.gv.at/en/fma-thematic-focuses/fma-focus-on-bitcoin-co/ (accessed 28th September, 2018).
(11) Hindelang, S. (2014) 'Kommentierung der Vorschriften zum Kapital- und Zahlungsverkehr im AEUV', WHI-Paper 02/2014, Art. 63, No. 197.
(12) Tomanek *et al.*, see ref. 5 above.
(13) Harrich, A. (2011) 'ZaDiG: Zivilrechtliche Aspekte des Zahlungsdienstegesetzes', 2.4.2.1. Erbringung von Zahlungsdiensten, recitals 28 and 58, Österreichische Bankwissenschaftliche Gesellschaft, Vienna; Raschauer, B. (2015) 'Finanzmarktaufsichtsrecht', Verlag Österreich, Vienna, pp. 305f.
(14) Directive 2004/39/EC of the European Parliament and of the Council of 21st April, 2004 on markets in financial instruments amending Council Directives 85/611/EEC and 93/6/EEC and Directive 2000/12/EC of the European Parliament and of the Council and repealing Council Directive 93/22/EEC.
(15) Directive 2014/65/EU of the European Parliament and of the Council of 15th May, 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU.
(16) Regulation (EU) No. 600/2014 of the European Parliament and of the Council of 15th May, 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012.
(17) Commission Regulation (EC) No. 1287/2006 of 10th August, 2006 implementing Directive 2004/39/EC of the European Parliament and of the Council as regards recordkeeping obligations for investment firms, transaction reporting, market transparency, admission of financial instruments to trading and defined terms for the purposes of that Directive.
(18) Commission Delegated Regulation (EU) 2017/565 of 25th April, 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council as regards organisational requirements and operating conditions for investment firms and defined terms for the purposes of that Directive.
(19) Annex I, Section C, Subpar 10, last sentence of directive 2014/65/EU of the European Parliament and of the Council of 15th May, 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU.
(20) BaFin, 'Hinweisschreiben GZ', WA 11-QB 4100-2017/0010 v. 20. 2. 2018, S.2.; Klöhn, L., Parhofer, N., and Resas, D. (2018) 'Initial coin offerings (ICOs)', *Journal of Banking Law and Banking*, Vol. 30, No. 2, pp. 89, 98.
(21) Recital 26 of Commission Regulation (EC) No. 1287/2006 of 10th August, 2006 implementing Directive 2004/39/EC of the European Parliament and of the Council as regards recordkeeping obligations for investment firms, transaction reporting, market transparency, admission of financial instruments to trading, and defined terms for the purposes of that Directive.
(22) https://cryptovest.com/news/stolen-nem-fund-forever-tainted-not-sold-on-exchanges/ (accessed 28th September, 2018).
(23) Gibbs, S. (2017) 'WannaCry: hackers withdraw £108,000 of bitcoin ransom', *The Guardian*, available at: https://www.theguardian.com/technology/2017/aug/03/wannacry-hackers-withdraw-108000-pounds-bitcoin-ransom (accessed 28th September, 2018).
(24) See, for example, Point 4.18 of the Cryptoassets-Taskforce (2018) 'Cryptoassets Taskforce: Final report', HM Treasury, London.