Economic and Legal Aspects of Electronic Money

Ekonomické a právní aspekty elektronických peněz

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Abstract

The term "electronic money" first appeared in Czech legislation in 2002 as the result of the transposition of legislation into the Czech Republic's legal system in anticipation of the country's accession to the European Union. This term subsequently reappeared in 2009 during the recodification of the legal regulation of payment services, payment systems and electronic money. At this time, the definition was subjected to certain changes which continue to exert a significant influence on current practice with respect to the issuance and subsequent use of electronic money. This paper addresses the term "virtual money" and considers the mutual relationships between "electronic money", "cashless money" and "virtual money" from the point of view of selected legal and economic approaches. The aim of the paper is to employ the analytical method in order to investigate selected legal and economic aspects of the various interpretations of the categories "electronic money", "cashless money" and "virtual money". A comparative analysis approach will be applied so as to ascertain both the legal and economic differences between these categories and general conclusions will be suggested employing the deduction method. The article is further concerned with the influence of these categories on the monetary base and money supply indicators.

Keywords

electronic money, virtual money, issuer of electronic money, payment card, regulation, emission, monetary base, money supply

Abstrakt

V českém právním řádu se objevil pojem „elektronické peníze" poprvé v roce 2002. Jednalo se o kategorii, která byla do právního řádu České republiky transponována v souvislosti s přípravou České republiky na vstup do Evropské unie. Následně se tento pojem znovu objevil v roce 2009 při rekodifikaci právní úpravy platebních služeb, platebních systémů a elektronických peněz. Při této příležitosti došlo k tomu, že kategorie doznala určitých změn, které však mohou mít značný vliv na současnou praxi při vydávání a následném využívání elektronických peněz. Stať se mj. také dotkne pojmu „virtuální peníze" a bude se zamýšlet nad vzájemným vztahem „elektronických peněz", „bezhotovostních peněz" a „virtuálních peněz", a to z pohledu vybraných právních a ekonomických přístupů. Cílem příspěvku je pomocí metody analýzy interpretovat vybrané právní a ekonomické aspekty různých přístupů ke kategoriím „elektronické peníze", „bezhotovostní peníze" a „virtuální peníze". Komparativní analýzou budou zjištěny jak právní, tak ekonomické rozdíly mezi těmito kategoriemi a metodou dedukce definovány obecné závěry. Stať se zabývá vlivem těchto kategorií na ukazatel měnové báze a peněžní zásoby.

Klíčová slova
elektronické peníze, virtuální peníze, vydavatel elektronických peněz, platební karta, regulace, emise, měnová báze, peněžní zásoba

JEL Codes
E42, G23

Introduction

Electronic money as a category first appeared in Czech legislation in Act No. 124/2002 Coll., on the Transfer of Financial Means, Electronic Payment Tools and Payment Systems (the Act on Payment Systems, hereinafter referred to as "APS 2002"). The APS 2002 consisted of the transposition of several European Union (hereinafter referred to as the "EU") directives into Czech legislation in anticipation of the Czech Republic (hereinafter referred to as the "CR") acceding to the EU, and aimed at the harmonisation of selected services in the areas of payment systems and accounting within EU countries. The collection of directives included Directive of the European Parliament and of the Council 2000/46/EC dated 18 September 2000 on the taking up, pursuit of and prudential supervision of the business of electronic money institutions (hereinafter referred to as "Directive 2000"). Provisions § 14 to 22 of APS 2002 addressed the issue and use of electronic payment tools, provided a definition of electronic money and electronic payment tools and, for the first time, laid down a legal definition of those authorised to issue electronic money, i.e. so-called electronic money institutions. This essay intends to focus on the category of "electronic money" only (without reference to the other new legal terms introduced in APS 2002) and aims to provide an economic and legal analysis of the categories "electronic money" and "virtual money" as well as a detailed comparison of the definitions thereof. The essay will then go on to provide the author's opinions concerning the potential related practical impacts.

The descriptive method was used in the compilation of this paper with reference to the terms "electronic money", "cashless money" and "virtual money", whereas the comparative method was used for the purpose of their mutual comparison. The links between cashless, electronic and virtual money and the monetary base and money supply were subsequently investigated as indicators which might be influenced by the issuing of electronic and digital money. General conclusions with respect to the various economic and legal aspects were then defined on the basis of comparative analysis employing the deduction method.

It is anticipated that the contribution of the paper will be seen in the light of the connection between the legal and economic aspects issuing from the influence of electronic, cashless and digital money in the areas monitored.

1 The Term "Electronic Money"

A comparison of APS 2002 and Directive 2000 reveals that the term "electronic money" stems from the Directive with, nevertheless, a number of small differences. Article I para. 3 letter b specifies that "electronic money" refers to cash value expressed as a claim on the issuing institution which is:

a) stored within an electronic medium;
b) issued against the receipt of a financial sum, the value of which shall not be lower than the issued cash value;
c) received as a payment tool by institutions other than the issuing institution.[1]

APS 2002 defines electronic money as follows:

Electronic money is a cash value that:

a) represents a claim on the issuer,
b) is stored within an electronic financial tool,
c) is issued against the receipt of a financial sum with a lower value than that of the electronic money issued and
d) is accepted as a payment tool by persons other than the issuer.[2]

Beyond the terms of Directive 2000, APS 2002 in provision § 15 para. 2 defined an electronic payment tool as "a payment tool" that maintains the cash value in an electronic form.

By means of a simple comparison of the texts of Directive 2000 and APS 2002 it is evident that the harmonisation norm emphasises in its list of provisions "a claim on the issuer" as a separate condition. This requirement in fact appears logical in terms of the nature of electronic money and the issuance thereof.[3] There is a clear difference in terms of the provision relating to maintaining the value of electronic money. The Directive specifies that the value of the financial sum involved must be maintained when using an electronic medium; the APS 2002 version, however, refers to maintaining the value within an electronic financial tool. The difference in this criterion is important in terms of practical significance. Electronic financial tool refers to e.g. the so-called electronic wallet, i.e. a type of "payment card" featuring an electronic record on the specific amount of electronic money contained within the body of the electronic financial tool, i.e. a data medium that, at first sight, appears the same as a standard payment card. The focus of the provision of Directive 2000 on the other hand is more general in that an electronic medium refers to a magnetic or chip entry on any data medium that is capable of functioning as "an electronic financial tool"; nevertheless, it might also be regarded as the "computer memory" or "computer server".

Notwithstanding, it can be stated that APS 2002 clearly defines the characteristics of electronic money which is applicable both in practical terms and with concern to the theory

1 *A quotation from Directive of the European Parliament and the Council 2000/46/ES dated 18 September 2000 on the taking up, pursuit of and prudential supervision of the business of electronic money institutions.*

2 *A quotation from Act No. 124/2002Coll., on the transfer of financial means, electronic payment tools and payment systems (Act on payment systems, § 15 para. 3, as amended) indicating that the original characteristics included provisions specifying only that "electronic money is a cash value maintained within an electronic financial tool".*

3 *Electronic money can be issued only against the receipt of cash or its transformation from cashless money, i.e. by transfer at the suggestion of the holder of electronic money to its issuer from the current or payment account of the holder to the registered "bank subaccount" of the issuer of electronic money. No form of issue (e.g. fiduciary) is permissible.*

of payment systems. Theory concerning banking as outlined in various literature sources[4] unequivocally adopted those characteristics of electronic money as defined in APS 2002. However, it is important to point out that the relevant sources failed to address electronic money as an alternative form of money. Theoretical literature continued to classify forms of money as simply "cash" and "cashless". The afore-mentioned characteristics, however, clearly defined the term "electronic money" and, unless these four criteria specified in APS 2002 were met, the financial sums in question could not be considered electronic. Thus, according to the author, APS 2002 introduced a new term with respect to how money is viewed, i.e. the term "electronic money". As a result of APS 2002, money can be classified in terms of its form as follows:

- cash – banknotes and coins,
- cashless – accounts held at banks or other authorised financial institutions,
- electronic – a cash value entered within an electronic financial tool.

1.1 Change in 2009

In 2009, Act No. 284/2009 Coll. (hereinafter referred to as "APS 2009") on payment systems came into force, again with the aim of transposing several EU directives referred to in § 1 APS 2009 into Czech legislation, i.e. Directive of the European Parliament and the Council 2009/110/EC dated 16 September 2009 (hereinafter referred to as "Directive 2009") on the approach to the operation of electronic money institutions, on their performance and caution supervision over this operation, an amendment to Directives 2005/60/EC and 2006/48/EC and the cancellation of Directive 2000/46/EC. This norm introduced *inter alia* the term "electronic money institution" that, under specific conditions stipulated in the directive, was entitled to issue (but not emit) electronic money.[5] In addition, this directive also contained a new definition of electronic money which article 2 of para. 2 of Directive 2009 defines as follows:

"Electronic money maintains electronically as well as magnetically the cash value expressed by a claim on the issuer issued against the receipt of financial sums for the purpose of performing a payment transactions defined in article 4 point 5 of Directive 2007/64/EC and received by a natural person or corporate body other than the issuer of the electronic money".

The above features are similar to those specified in Directive 2000 with the exception that the requirement that electronic money should be maintained in an electronic medium or, according to the transposition of APS 2002, within an electronic payment tool was omitted and that it is sufficient for the cash value to be maintained electronically or magnetically. No specification was set out as to where the electronic money should be maintained. Moreover, Directive 2009 no longer specified where the cash value should be maintained,

4 *E.g. compare DVOŘÁK P. (2015) Bankovnictví pro bankéře a jejich klienty, SCHLOSSBERGER, O. and Ladislav HOZÁK. (2005) Elektronické platební prostředky, KLIMIKOVÁ, M. Platobný styk. (2008), NOVÁKOVÁ V. and V. SOBOTKA Slabikář finanční gramotnosti: učebnice základních 7 modulů finanční gramotnosti. (2011) or BARAK, J. and working group (2003) Zákon o bankách – komentář a předpisy související.*

5 *See provisions in article 2 para. 1 of Directive 2009.*

i.e. whether in a financial or payment tool or in the central server of a bank or other issuer. The remaining two criteria remained virtually unchanged. It is necessary to point out here that both Directive 2000 and Directive 2009 emphasized the fact that electronic money can only be issued if its value of the same amount (or not lower value) was received by this issuer. Again, it fails to mention whether this applies to the receipt of cash or of cashless money via a transfer from a client's account - the potential holder of electronic money issued by the issuer of electronic money.

The transposition of this part of the Directive into Czech APS 2009 resulted in the following definition:

"Electronic money is a cash value that:
a) represents a claim on those who issued it,
b) is maintained electronically,
c) is issued against the receipt of a financial sum for the purpose of performing a payment transaction and
d) is received by persons other than the issuer". [6]

Compared to the original text in APS 2002, a small change is evident in the second condition concerned with fulfilling electronic money requirements, i.e. that related to maintaining the cash value electronically and not within an electronic financial tool.

In the author's opinion, this small change in the characteristics of electronic money led to the question as to whether money can indeed be classified as cash, cashless and electronic. Is this question therefore justified? Before attempting to answer the question, the author intends to provide a definition of cashless money in the context of current legislation.

2 Cashless Money

As previously mentioned, general theoretical literature states that **cashless money may take the form of accounting entries in the bank accounts of clients held at banks or other authorised institutions.** Cashless money is transferred to such accounts via a cashless transfer or by means of the payment of cash at institutions which produce a written receipt of the cash payment to the client's account whereupon the cash is deposited in the safe room of the respective institution or is sent to the Czech National Bank (CNB) or another bank. Providers of payment services consist principally of banks and savings and credit associations since financial sums paid to the latter two institutions are usually considered to be deposits. Since 2009, however, in accordance with APS 2009 it has also been possible for financial sums to be placed with payment institutions and providers of small-scale payment services for the provision of payment services on the basis that a client's non-implemented financial sums may be deposited in an account registered at such institutions. Notwithstanding, such sums are not considered deposits.[7]

6 Quotation from § 4 of Act No. 284/2009 Coll., on payment systems.

7 See § 19 APS 2009.

In neither APS 2009 nor APS 2002 is cashless money specified. Indeed, the various legal regulations concerning cash are set out in Act no. 136/2011 Coll., on the circulation of banknotes and coins including related implementing regulations. Nevertheless, the act does not directly provide a description of the term "cash"; rather it principally addresses the characteristics of banknotes and coins and the handling thereof.

With respect to the issue of cashless money as entries to clients' accounts at a respective institution, such records are maintained in the respective bank's day book whether it is in paper or other form. For the past several decades such record-keeping has been conducted electronically, i.e. in the form of electronic entries at banks or other institutions. However, this has never been the case with respect to electronic money, with regard to which the recording either takes the form of a client deposit (often sight deposits) at a bank or savings or credit association or "hot" financial sums registered in a payment account at a payment institution or provider of small-scale payment services. In both cases, however, the financial sums involved will serve in the future as payment services. Moreover, such financial sums registered at banks or savings or credit associations may become a different deposit by virtue of Act No. 89/2012 Coll., the Civil Code, § 2676. A savings book or one-time deposit of a different type may be involved in accordance with the regulations of the bank or savings or credit association. Nevertheless, the role of financial sums entrusted to a payment institution or provider of small-scale payment services cannot be changed. Moreover, they cannot even be interest-bearing since, as previously emphasised, they do not represent deposits and they must not be used in connection with the other business activities of the payment institution unless APS 2009 sets out otherwise.[8]

3 Cashless Money versus Electronic Money

It is intended that this part of the essay will focus on a comparison of the characteristics of electronic money as defined in APS 2009 with those of cashless money as outlined previously.

In order to be considered electronic, money must fulfil certain fixed criteria as discussed in the introduction to this paper. The first criterion that must be met in order that money is to be considered electronic is that it applies to **a claim against the issuer of the electronic money.** However, if cashless money is deposited with a bank or savings or credit association (in this part of the paper the author intends to disregard the fact that cashless money can also be received by payment institutions or providers of small-scale payment services under conditions stipulated in APS 2009), it also represents a claim of the client on the respective bank or association. Conversely, the bank or association records such sums received in its accounting system as a liability vis-a-vis the client. Such financial sums should also be recorded by electronic money institutions, although this depends on how exactly the electronic financial sums are transferred to the holder. Nevertheless, this criterion can be regarded as identical both in terms of electronic and cashless money.

8 Compare § 20 par. 4 APS 2009.

The second criterion concerns the fact that **electronic money must be maintained electronically** which means that money is deposited directly either within an electronic financial tool (e.g. an electronic wallet) or is registered in a central computer system. The issue of whether electronic money is or is not recorded in an account is not mentioned in APS 2009 (nor in APS 2002). Nevertheless, it must be assumed that there has to be some level of record-keeping since a holder of electronic money is legally entitled to request a reverse exchange from the issuer at a ratio of one-to-one.[9] Thus the issuer must be aware of how much of the electronic money of the client has not been spent and, should the holder request a reverse exchange in the form of cash or cashless money, the issuer is legally bound to do so. Cashless money is currently also registered electronically in the central computer of banks or savings or credit associations; nevertheless, this is not a statutory obligation. APS 2009 refers to managing payment accounts (specifically, bank payment accounts are described as current accounts which, however, by virtue of Act 513/1991Sb., the Commercial Code[10], were always regarded as deposit accounts); however, it does not mention anything concerning the methods or technology to be used in their management. It can be assumed that it is possible to manage such accounts via book accounts as was common in the days before the advent of computer technology. This, however, is not an option with respect to electronic money since the process requires the electronic (by virtue of Directive 2009) management (recording) thereof or "insertion" into the respective medium. It can be concluded, therefore, that this criterion is essential with regard to electronic money, regardless of the fact that this principle does not refer to cashless money. However, in reality, cashless money is currently also recorded electronically at banks or other providers of payment services.

A further criterion consists of the fact that electronic money **is issued against the receipt of financial sums for the purpose of performing payment transactions.** This criterion is unique when comparing these two categories, i.e. this condition specifies that electronic money cannot be created if it has no further underlying interest. Electronic money can be issued only by an authorised agent that is obliged to ensure that the amount of electronic money will always be covered by a real value paid in cash or will be transferred to the credit of the issuer's account managed at a financial institution (often at a bank or a savings association) as cashless money. No such criterion applies to cashless money since it is not issued but simply transferred from one account to another, i.e. it was created either via the issuance of ready money that the client had previously physically delivered to the financial institution which was then transferred to the client's account in the form of a book entry or it was obtained as a result of the fiduciary issue of cashless money. However, one aspect is the same, i.e. both electronic money and ready money or cashless money serve as transaction payments. Electronic money is used for the payment of goods or services and the clearance thereof is conducted in a cashless manner; nevertheless, there may be a difference with respect to its transfer. If it is maintained within an electronic payment tool, electronic money is then transferred from its medium to the terminal of the goods or services provider who then forwards it for clearance by the relevant processing bank. Then it is entered into the client's account in the form of cashless money, most often to a current or payment account. However, if the electronic money takes the form of an

9 See § 124a. APS 2009

10 The Act was repealed on 1 January 2014.

electronic entry in the central computer of the issuer, the use of a payment tool initiates the transfer of the input for the clearing of the relevant amount of electronic money as a debit to the issuer's account and a credit to the account of the respective goods or services provider. The electronic money issuer then has to perform a mirror "accounting" transaction in the accounting books of the respective client and thereby reduce the electronic money value by this accounted sum.

The final criterion consists of the condition that the electronic money amount has to be accepted by persons other than those who issued it, i.e. that the acceptance of the electronic money issued is ensured by more than one subject than the issuer. This criterion is relatively common with respect to cashless money; however, it is also true that cashless money can take the form of money used in the transfer of financial sums between two accounts held by the same client and at the same financial institution. If electronic money was used only for the payment of goods and services provided solely by the issuer, this would not represent electronic money in terms of APS 2009, even though all the other criteria might be met. In such cases it might be considered as referring to subscribed services or to an advance payment for the goods or services of the respective subject. Moreover, APS 2009 does not require that the subject providing such services have a special licence for the conducting of such a business relationship; this commonly refers to prepaid loyalty cards issued by various retailers etc.

4 Virtual Money

Virtual money is not currently regulated.[11] Literature commonly refers to the categories of "digital money", "virtual money" and "cryptocurrency".[12] However, it is difficult to differentiate between expressions such as "virtual" and "digital" money. For example, Bitcoin is often referred to as virtual as well as digital cash.[13] Virtual currency might be considered to be private money used for the purchase and sale of goods within various online communities such as social networks, virtual worlds and online games. Digital money differs from virtual money used in the "real world", e.g. Bitcoin is suitable for both categories yet only one official methodological guideline, issued by the relevant Czech state authority, defines Bitcoin as digital currency. However, the Bitcoin virtual currency does not fulfil the definition of "electronic money" in terms of the APS.

The EU defines virtual money as the digital representation of a monetary value that is not issued by a central bank or public authority, but is used by natural or legal persons as a medium of exchange and may be transferred, stored or traded electronically. Although a number of these characteristics resemble the functions of money or properties that fall

11 As at 14 March, 2016

12 E.g. WAGNER, A. (2014) Digital vs. Virtual Currencies. Available at: https://bitcoinmagazine.com/15862/digital-vs-virtual-currencies/

13 WAGNER, A. (2014) Digital vs. Virtual Currencies. Available at: https://bitcoinmagazine.com/15862/digital-vs-virtual-currencies/

within the competence of EU E-Money (Ed. Author - see Directive 2009), it is safe to state that virtual money as the digital representation thereof is not electronic money.[14]

Cryptocurrency might be considered a form of digital currency with respect to which encryption techniques are used in order to control the generation of units of currency and the verification of the transfer of funds and which operates independently of central banks.[15] The emission of cryptocurrency is based on cryptographic methods such as proof-of-work and asymmetric encryption. The operation of such systems is decentralised in the form of a distributed computer network. With cryptocurrency no forced cancellation of transactions exists and funds cannot be frozen or confiscated without access to the private owner key. It is normal for an upper limit to be set for the total issue volume. Currently, cryptocurrency is pseudonymous – all related transactions are indeed public, but have no ties to particular persons. It can be stated that the terms "digital money", "virtual money" and "cryptocurrency" are almost synonymous for a category of money that does not have a real basis in the "real economy".

In conclusion the legal distinction between "cryptocurrency", "digital" and "virtual" currency in essence is unclear since no general legal regulation referring to this "currency" has yet been issued in the Czech Republic. Further, for the purposes of simplification, the term "digital money" will be employed herein. This begs the question as to whether "digital cash" and "cryptocurrency" can be considered to be electronic money within the meaning of the APS and relevant EU directives.

In order to clarify the role of virtual and digital money, the author proposes to provide a number of examples of opinions concerning the status of Bitcoin as the best known example of this commodity:

4.1 China

Bitcoin is not banned in China despite the fact that the regulation of Bitcoin is uncertain and financial institutions working with Bitcoin are advised to be particularly cautious concerning its use. The People's Bank of China has announced plans to strengthen the regulation of Bitcoin transactions, its distribution and other aspects related to this digital currency. It is intended that the new rules will clarify the government's position on trading in Bitcoin. In December 2013, the People's Bank of China decided to instruct financial institutions and payment service providers not to conduct Bitcoin transactions (Report No. 289),[16] and ruled that the payment systems of other countries should cease to conduct business with Chinese Bitcoin exchanges. In January 2014, however, the stance of the Chinese government was eased in this respect and the Chinese Bitcoin Exchange reopened in accordance with the opinion that report number 289 simply required registration with

14 *About Europena Banking Authority (2015) EBA Opinion on "virtual currencies". Available at: https://www.google.cz/?gws_rd=ssl#q=EBA+Opinion+on+%E2%80%98virtual+currencies%E2%80%99*

15 *http://www.oxforddictionaries.com/definition/english/cryptocurrency*

16 *CHEN, C. (2014) China and Bitcoin: Two Chinese Banks Announce That They Will Cancel Accounts Associated with Bitcoin or Litecoin. Available at: https://www.cryptocoinsnews.com/two-chinese-banks-announce-will-cancel-accounts-associated-bitcoin-litecoin/*

the Chinese Ministry of Industry and Information Technology and did not totally forbid transactions between Bitcoin and the yuan. Information subsequently issued on this subject in March 2014 was generally seen as positive in that it strengthened overall legal certainty in this respect which, in turn, will most likely lead to the expansion of business development using Bitcoin in China.

4.2 Finland

Finland's central bank initially refused to acknowledge Bitcoin as a currency, but then decided to include it in financial services.[17] The central bank opined that Bitcoin did not fall under the official definition of a currency as set out in legislation. Moreover, Bitcoin is not considered to be electronic money in Finland since the definition of electronic money requires that there is a publisher responsible for issuance, i.e. a condition which is not fulfilled in the case of Bitcoin.

4.3 France

The Autorité de Contrôle Prudentiel (ACPR) issued clear instructions relating to Bitcoin in January 2014 which warned French citizens of the danger of using Bitcoin.[18] This warning was similar to that published in an ECB directive and highlights the lack of control that Bitcoin users have, its extreme instability and the potential for its criminal exploitation. The guidelines also stated that any exchange office operating in France and exchanging this virtual currency must have concluded an agreement with the central bank or must work with a company registered for the depositing of financial resources.

4.4 Italy

The situation concerning Bitcoin in Italy is similar to that in the wider EU. Italy implemented an EU directive on the use of electronic money in 2009 via a number of government regulations commencing in 2012 defining electronic money and determining those persons authorised to issue electronic money. The use of electronic money is permitted but only by banks and electronic money systems which means that private sector agents must be approved and registered by the Central Bank of Italy. With the exception of these limitations, Italy does not regulate the use of Bitcoin which suggests that in Italy there is no official engagement in virtual money.

4.5 Japan

Currently, there is no legislation in Japan referring specifically to the use of Bitcoin; however, a number of government statements have been issued aimed at Bitcoin users and traders. In March 2014 the Prime Minister's Office issued an official statement highlighting that the Bitcoin currency does not fall under Japanese legislation and restricting com-

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17 STANLEY-SMITH, J. (2014) Finland recognises Bitcoin services as VAT exempt, 2014. Available at: http://www.internationaltaxreview.com/Article/3400689/Finland-recognises-Bitcoin-services-as-VAT-exempt.html

18 HAJDARBEGOVIC, N. (2014) French Regulator Requires Bitcoin Exchanges to Register. Available at: http://www.coindesk.com/french-regulator-requires-bitcoin-exchanges-register/

mercial banks from providing this product.[19] In the same statement it confirmed previous information that the Japanese Ministry of Finance and tax authorities were exploring the possibility of taxing Bitcoin and the potential for its regulation. At the same time the Japanese government announced that Japanese banks were obliged to report any suspicious potentially money laundering activities conducted by means of this digital currency.

4.6 Germany

Germany was the first country in the world to set out clear rules for companies working with Bitcoin. The German Central Bank warned investors that Bitcoin was both a risky and "highly speculative" currency. Furthermore, the German Finance Ministry issued a clear statement on how Bitcoin should be handled from the tax and administrative standpoints. In August 2013 German Finance Ministry officials issued several statements which established that Bitcoin cannot be regarded as a foreign currency asset, nor as electronic money and is considered to be "private money".[20] Further, according to the Ministry, Bitcoin is an "accounting unit" and not foreign exchange and, therefore, it is not governed by regulations relating to financial instruments.

4.7 Russia

In January 2014 the Central Bank of Russia issued a statement on the use of Bitcoin establishing that it is a substitute for money and that, therefore, its use is prohibited in Russia. The Central Bank of Russia also warned against the misuse of Bitcoin for the purpose of money laundering and the financing of terrorism and stated that any Bitcoin exchange for free convertible currency would be considered a suspicious transaction.[21] In September 2014, Deputy Finance Minister Alexei Moiseev stated that during 2015 legislation would be approved prohibiting the exchange of Bitcoin for fiat money.

5 Electronic Money versus Digital Money

The question must be posed as to whether "digital money" and "cryptocurrency" can be considered electronic money in accordance with the APS and the appropriate EU guidelines. Based on what has been stated above, it is perhaps reasonable to claim that the answer is a definitive no; indeed, they appear to form a completely different category of their own and can be differentiated in terms of several aspects as summarised in the following table:

19 *CRUZ, K. (2014) Bitcoin Regulation in Japan. Available at: https://bitcoinmagazine.com/17508/bitcoin-regulation-in-japan/*

20 *CLINCH, Matt. (2013) Bitcoin recognised by Germany as 'private money'. Available at: http://www.cnbc.com/id/100971898*

21 *Russian Central Bank warns against using Bitcoin (2014). Available at: http://rt.com/business/bitcoin-warning-russia-bank-280/*

Table 1: The differences between digital and electronic money

Criterion	Digital money	Electronic money
Accessibility	Largely limited to Internet connection	Access to electronic devices such as mobile phones, and an agent network
Value	Determined by supply and demand, and trust in the system	Equal to amount of fiat currency exchanged into electronic form
Customer ID	Anonymous	Financial Action Task Force standards apply for customer identification (though such standards permit simplified measures for lower risk financial products)
Production	Mathematically generated ("mined") by peer network	Digitally issued against receipt of equal value of fiat currency of central authority
Issuer	Community of developers, called "miners"	Legally established e-money issuer
Regulator or oversight	None, though regulators are currently exploring	Regulated by central authority, typically central bank

Source: author's modifications[22]

The first criterion refers to the **accessibility** of given forms of money. Digital money is only available via an internet connection, whereas electronic money can be deposited electronically, for example via a mobile telephone, by payment card (in the form of an electronic wallet) or within the network of a given issuer.

The **value** of digital money is highly disputable since it is dependent not only on the level of trust in a given currency, but also on its supply and demand.[23] Electronic money can be issued merely as a counter-value to deposited cash or as money sent to an issuer of electronic money in a cashless manner.

A further important criterion concerning the differentiation of digital money and electronic money consists of the degree of **relative anonymity**. Rules relating to the correct **identification of the client** are fully adhered to with respect to the issuance of electronic

22 *PARKER, S. R. (2014) Bitcoin vs Electronic Money. CGAP.org. Available at: http://www.cgap.org/publications/bitcoin-vs-electronic-money*

23 *See for example FILLNER, K. Bitcoins – 7 reasons why they deserve your attention this year (Bitcoin - 7 důvodů, proč si letos zaslouží vaši pozornost). In.: Bankovnictví No. 9/2015.*

money in accordance with valid legal regulations and the recommendations of the multinational FATF[24] organisation.

Moreover, the criterion related to the so-called "**production**" (acquisition) of money also differs in that:

- Electronic money is not issued, i.e. in the sense of emitted, rather it is issued versus the acceptance of non-cash money or in the form of cash. Thus, electronic money represents the holder's claim on the issuer and issuance cannot affect the monetary mass.

- Virtual money (digital) is "mined", i.e. Bitcoin production is technically known as "mining".[25] This is a special process the complexity of which is algorithmically programmed and increases continuously in line with the amount of technical resources involved. Mining is the process of using computer resources to process transactions for the implementation of a safety net and for maintaining synchronisation between all the users within a given system.

This criterion is closely linked to the issuer or emitter criterion. The issuer of electronic money is a licenced or registered subject established in accordance with valid legislation, i.e. according to the APS for example in the Czech Republic, while emitters of digital money are unregulated subjects. Moreover, the final criterion, **regulation and supervision** by a central authority is based on the same principle, i.e. as stated above, digital money, in the main, has yet to be regulated, while electronic money is already subject to regulation.[26]

6 Economic Aspects

Despite the fact that this paper is mainly concerned with electronic money, the deductive method will also be used in order to consider whether electronic money, as well as cashless and digital money, influences two important issues:

a) the monetary base and
b) the money supply.

In order that the facts resulting from the afore-mentioned analysis of individual monetary terms be applied to these two areas, the author first intends to provide selected background information.

These two categories are essentially related since the monetary base (B) can be considered to be money in circulation held by the public (i.e. banknotes and coins) and balances in trading bank accounts held at the central bank. Currency is held by households, compa-

24 The Financial Action Task Force.

25 ANTONOPOULOS, A. (2014) Mastering Bitcoin. O'Reilly Publishing, p. 17.

26 See for example. FILLNER, K. Bitcoins – 7 reasons why they deserve your attention this year (Bitcoin - 7 důvodů, proč si letos zaslouží vaši pozornost). In.: Bankovnictví No. 9/2015.

nies and the public sector, including cash held at trading banks,[27] i.e. in the form of cash as banknotes and coins. It can be expressed by the equation:

$$B = C + R, \tag{1}$$

where C is currency held by the public,
R is balances in trading bank accounts held at the central bank (bank liquidity at the central bank, reserves).

The money supply (M) is then understood (in accordance with the sources stated under footnote no. 27) to be the sum of the currency and deposits held by the public at trading banks. This equation can be expressed as:

$$M = C + D, \tag{2}$$

where C is currency held by the public,
D is deposits held by the public at trading banks.

The issuance of banknotes and coins into circulation is termed "emission" and money issued in this way is called **currency** and forms, therefore, part of both the monetary base and the money supply. If banknotes and coins have not been released into circulation, they are not considered money (they are not bearers of the functions of money) but are merely a reserve (a product) stored at the central bank (this essentially involves storage in a warehouse).

The author now proposes to provide two case simulations in order to ascertain to what extent the issuance of electronic money affects the monetary base and money supply.

Case 1

The currency held by the public C amounts to 100 units, public deposits in trading banks D to 200 units and balances in trading bank accounts held at the central bank R 500 units. If electronic money (P_{el}) is issued as a counter-value of 20 units of currency, i.e. cash money is converted into electronic money, the equation according to (1) is as follows:

$$B = (C - P_{el}) + R \tag{3}$$

This results in a currency reduction of twenty units due to the fact that only banknotes and coins are considered to constitute currency. The monetary base is then reduced by 20 units, i.e. from 600 to 580.

In the same way, the money supply M will also be reduced according to equation (2), i.e. to 280:

$$M = (C - P_{el}) + D \tag{4}$$

27 *E. g. JÍLEK, J. (2013) Finance v globální ekonomice I – Peníze a platební styk. Praha: GRADA, p. 185, POLOUČEK, S. a kol. (2013) Bankovnictví. Praha: C.H.Beck, p. 51 or MEJSTŘÍK, M., PEČENÁ, M. a P. TEPLÝ (2014) Bankovnictví v teorii a praxi/ Banking in Theory and Practice. Praha: Karolinum, p. 142-144.*

The issuance of electronic money appears therefore to reduce both variables, i.e. the monetary base B and the money supply M in the amount of the counter-value of the currency due to a reduction in the set of money in circulation C.

However, issuers of electronic money are obliged according to the APS[28] to protect the funds of holders of electronic money which has been submitted to their issuers for a change of form and to do so in two ways, one of which involves the depositing of the submitted currency in trading bank accounts or savings or credit associations. These funds then appear in the trading banks' accounts at the central bank in a certain amount, but up to a maximum of 100% of the electronic money issued P_{el}.

It is therefore possible to form the partial conclusion, based on the afore-mentioned considerations, that electronic money issued against a currency need not influence the monetary base B variable – there could be both an equalling of the value of the issued electronic money Pel on the one hand and an increase in the value of trading banks' balances at the central bank D in an amount from 1% to 100% of the value of the issued electronic money on the other. This can be expressed by the following equation:

$$B = (C - P_{el}) + (R + P_{el\,[0-100\%]}) \tag{5}$$

In terms of the example provided, the currency base B indicator will be in a value range of from 580 to 600 units.

However, this conclusion cannot be applied to the money supply since a reduction in the value of currency C as a counter-value of the electronic money issued is not balanced by an increase in public trading bank deposits D since, in turn, the electronic money issued does not constitute a deposit and thus does not influence the amount of this indicator.

Case 2

In this case electronic money is issued as a counter-value for cashless money received. Given that the holders of electronic money are either households, companies or the public sector, the issuance of electronic money P_{el} in the amount of 20 units will not reduce (1) the currency C, but may increase the indicator R due to the protection of the funds of electronic money holders which were transferred to the issuer's account as in Case 1. The counter-value thus acquired of the issued electronic money may appear as an increase in the balances of trading bank accounts at the central bank R. The cashless transfer of funds when issuing electronic money P_{el} may therefore have an influence on the monetary base in that it may be caused to increase by up to 20 units within the context of variable R. The currency base may therefore move in the interval from 600 to 620 units. This can be expressed as follows:

$$B = C + (R + P_{el\,[0-100\%]}) \tag{6}$$

28 § 52e point b) APS.

As far as the money supply M indicator and the issuance of electronic money as the counter-value of a cashless transfer in the amount of 20 units is concerned, the money supply is reduced by this amount in equation (2) since public deposits at trading banks D are reduced by this amount (the value of deposits to be used for the issuance of electronic money is reduced since they will be sent in the form of cashless money from the client's bank, i.e. the holder of the electronic money in relation to its issuer). The money supply will thus have a value of 280 units.

This consideration can be expressed as follows:

$$M = C + (D - P_{el}) \tag{7}$$

Given that the issuance of electronic money may influence both indicators, it is regulated by the central authority in such a way that the conversion of one form of money into another is under direct control and is unable to lead to the uncontrolled issuance of such money or even to its emission, which would not be covered by the currency or by trading bank deposits.

With respect to the category of "digital or **virtual money**", such funds are the consequence of "mining" which, admittedly, is similar to the emission of money. However, **it is not possible to consider them as constituting currency** if they do not fall under the regulation of the central emitting bank as substantiated above. Mined digital money may act as a means of trade – it can be purchased (acquired) thus the purchase thereof will have an influence on both currency C (the currency will be reduced by the purchase for "cash") and on deposits D (public deposits are reduced solely due to the cashless purchase of digital currency; they cannot increase the value of these deposits by the same amount due to the fact that banks do not hold accounts for virtual currencies). Digital money, therefore, cannot logically influence the bank balances at the central bank R indicator since, presently at least, central banks essentially do not recognise virtual money.

The fact that digital money has escaped regulation by central authorities (emitting banks) means that its value does not feature in the directly monitored indicators of the monetary base B or the money supply M, notwithstanding the fact that it may influence the amount thereof during the trading process.

Conclusions

The paper focused on:

- the analysis of the characteristics of the term "electronic money" as defined by Directive 2000 and its recoded version Directive 2009 with a comparison of their transposition into APS 2002 and APS 2009,
- the characteristics of "cashless money" and "digital money" and the definition thereof,
- a comparison of the category "electronic money" in accordance with APS 2009 with the term "cashless money" that is not defined in Czech legislation (nor in that of the EU),
- a comparison of "electronic money" and "digital money",
- the question of whether electronic money and virtual (digital) money influence the monetary base and the money supply indicators.

From the above analysis the author concludes that it is impossible to consider digital currencies such as Bitcoin and Litecoin simply as another form of electronic money in terms of EU legislation, namely the 2009 Directive. This view is further justified by the above summary of the approaches of various countries to the issue of virtual money. The Czech Republic has not yet regulated virtual currencies with the exception of the publication by the Czech Ministry of Finance in September 2013 of "Methodical instruction no. 2 of the Financial Analytical Unit of the Ministry of Finance". The instruction states that trading with any digital currency should be considered risky and calls on financial institutions and other entities to consider any trade transaction amounting to over EUR 15,000 as suspicious and to notify the FAU thereof.

The analysis led to the following conclusions:

The terms of Directive 2000 differed from those transposed into APS 2002 in terms of a difference in the second criterion of what can be regarded as electronic money. In accordance with the transposition norm (APS 2002), only the value contained (maintained) within an electronic financial tool can be considered electronic money.

The terms transposed into APS 2009 basically corresponded to those of Directive 2009 as well to the requirements of the original Directive 2000 which was subsequently repealed.

The terms "electronic money" and "cashless money" are two different legal terms and are significant in terms of theoretical interpretation. The term "electronic money" is subject to legal regulation whereas "cashless money" is not directly regulated. Existing legal regulations, however, recognise this term.

The category "cash" or "ready money" is clearly defined in the relevant legal regulation.

Virtual money cannot currently be considered to be electronic money since it does not meet requirements set out in European or Czech legislation.

The issuance of electronic money influences both the monetary base indicator and the money supply since the issuance thereof takes place in the form of a transformation of money from cash or cashless money into electronic money. This may influence variables such as currency C, public trading bank deposits D and trading bank account balances at central banks R.

By virtue of its being "mined", virtual (digital) money is in fact newly created which is closely linked to the term "the emission of money". However, its mining does not involve the transformation of one form of money into another, rather, "new funds" are created, i.e. so that it enters individual sectors of the economy as something "extra". Further, it is used for trading purposes, i.e. it can be purchased in the financial markets for currency or cashless money. This, as outlined above, may influence both the monetary base and the money supply. Given that the "creation" of digital money in most cases remains unregulated by central banks, which do not recognise the "emission" thereof, such money is not directly included in the currency variable.

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