Report on the Digital Currencies International Conference*

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On 6 November 2017, the Magyar Nemzeti Bank (MNB) Department of the Corvinus University of Budapest hosted an international conference on digital currencies at the Bálna event hall in Budapest. The event´s keynote speaker was *Michael Kumhof*, Senior Research Advisor at the Bank of England, well-known expert on the topic and a member of the editorial team of Ledger, the first proofread academic journal specialising on virtual money and blockchain technology. *Ken Lo*, owner and CEO of the ANX Hong Kong Bitcoin exchange, arrived from the private sector and made the event unique with his presentation. There was substantial interest in the conference and the topic, as was clearly reflected by the nearly 450 participants. The first section of the conference focused on central bank digital currency (CBDC), while the second section was centred on Bitcoin and other altcoins as well as blockchain technology.

Dániel Palotai, executive director at the Magyar Nemzeti Bank (MNB), opened the conference; in his welcome speech, he highlighted that innovations and fintech companies may restructure the current financial system in many aspects. Bitcoin and the Distributed Ledger Technology (DLT) serving it enable direct settlement between the participants without a central or intermediary party. Despite the increasing popularity of virtual money, experts disagree: some of them believe that Bitcoin and other alternative, encrypted digital currencies may not play the role of money over the long run since they are too volatile, risky and energy intensive. However, the global trend – according to which the market capitalisation of Bitcoin and other altcoins has substantially increased over the past period – cannot be disregarded. The question is: Will more mature versions of these alternatives, which have outgrown their childhood diseases, represent a challenge later on to fiat money and ultimately also a challenge to central banks? This is the key question not only for central banks and governments, but also for every credit institution.

In his opening address, *Kristóf Lehmann*, head of the MNB Department, expressed his joy at seeing the diverse range of participants which was partly due to the current interest in the topic, and partly to the appeal of the internationally recognised names among the speakers. Making reference to a recently published paper of BIS, Lehmann pointed out that it is not likely that the Bitcoin and other

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digital currencies will be able to take over the role of the currencies issued by states, but he underlined that the distributed ledger technology behind virtual money could be deployed in other areas. Most recently, a few large central banks (BoE, Fed, Riksbank) announced that they are analysing and testing the application opportunities of the technology and even the possible introduction of virtual central bank currencies. In order to clearly see what this is all about, it would be worthwhile to analyse and group digital currencies based on various attributes within the dimensions also discussed by Kristóf Lehmann. For example, based on who the issuer is (central bank or private), the form of the currency (electronic or physical), the participants who have access to it (every participant or only a limited circle of participants), and the type of settlement mechanism (centralised or decentralised).

Based on this classification, if we assume that the central bank is the issuer and the form of the currency is electronic, then we can still differentiate four different central bank currencies available in digital form: (1) currently existing reserves of commercial banks kept with the central bank, (2) the currently non-existing deposit accounts of households and firms kept with the central bank, (3) the settlement operating on distributed ledger basis exclusively available for commercial banks, and (4) digital currency available for the public, registered on distributed ledger basis, but issued by the central bank (this latter one would be, for example, the Swedish e-krona or FedCoin according to current plans).

Michael Kumhof previously worked for the IMF, where he was responsible for the development of the dynamic stochastic general equilibrium (DSGE) model, and was one of the authors of a study entitled “Chicago Plan Revisited”. With his co-author John Barrdear, Kumhof analysed the introduction of central bank digital currencies available for households and companies in their paper titled “Macroeconomics of Central Bank issued Digital Currency”. We might say that there is no other researcher in the world who is better prepared than Michael Kumhof when it comes to presenting the economic effects of central bank digital currencies.

In his address, Kumhof presented the economic effects of the introduction of central bank digital currency under the circumstances as detailed in the abovementioned study.[1] In the presented model, a stock of central bank digital currency equivalent to 30 per cent of the GDP is introduced in such a way that the central bank purchases a stock of government bonds from households, equivalent to the quantity of the issued digital currency. This reduces real interest rates and thereby boosts aggregate demand in parallel with decreasing tax burdens, thanks to which the potential issuing finally increases by 3 per cent in the model. In addition, the inflation target and the counterpointing of business cycles become more achievable through the countercyclical pricing of the central bank digital currency. The presenter pointed

[1] http://www.bankofengland.co.uk/research/Documents/workingpapers/2016/swp605.pdf

out that under the conditions they had calibrated, the introduction of the central bank digital currency does not modify the banks' money creating capacity, so the financial system will not be significantly restructured merely by the introduction of the digital currency. The nature of the introduction, a controlled transition and the analysis of novel financial stability risks call for further detailed research.

In connection, *Lajos Bartha*, Director of Financial Infrastructures at the MNB, noted in his presentation that currently everyone is curious to see what kind of challenge FinTech will represent for banks. However, considering the fact that an increasing number of central banks globally raise the idea of central bank digital currency – it is possible that in the end not the innovative FinTech companies, but rather the FinTech central banks will represent the biggest challenge for the traditional banking system. Bartha started off with a money theory and money history summary: he presented the various roles money should take, and the development path through history of legal tender as a result of various innovations. He highlighted that until now central bank currencies in digital form were only accessible by the banking system, i.e. they were not available to households and companies. One of the possible paths of development is that central bank currencies available in digital form will become accessible for the public, i.e. central bank digital currencies will be introduced. Bartha pointed out that a central bank digital currency available to the public can be implemented in several ways; by expanding the traditional account management systems and by the same token, anonymity should also be ensured along with digitalisation, which introduces a further aspect into our taxonomy based on BIS. The presentation listed different motivation factors driving the introduction of a central bank digital currency: placing innovation at the forefront; the availability of risk free digital money; increased financial awareness entailed by the even broader use of electronic payment methods; the support of more efficient monetary policy. All of these factors explain why a number of central banks are contemplating the possibility of introducing a central bank digital currency.

According to Bartha, however, we should also see that this possible introduction raises a number of questions and risks from the perspective of financial infrastructure as well, such as how could a central bank provide the related services, how could the cyber security resilience of the central infrastructure be ensured, how could the central bank meet those legal requirements (for example client due diligence) that the central bank itself requires from commercial banks. Bartha pointed out that the introduction could be implemented in at least three different manners: on a traditional account basis, on a "value basis", with solutions similar to prepaid cards, where not only the digital form but also anonymity can be ensured, or based on the distributed ledger technology also applied for Bitcoin, among others. According to the presentation, the pioneer Bitcoin has limitations in terms of money functions: the intermediary function is substantially restricted by the low

penetration in the acceptance network, the high exchange rate volatility limits the settlement unit function, while the value retention function is constrained not only by the previous factor, but also by the lack of an institutional background. Some factors limiting the role of the central bank digital currency in payment turnover also arise, which are partly specific Hungarian issues: although the technology is already generally available, cash turnover is still overwhelming in Hungary especially in the countryside; and if the market of payment services becomes one-tiered, who or what shall motivate further innovation or development?

In relation to the final proposal of Lajos Bartha, in the last presentation of the first section, *Gergely Szabó*, economic research expert at the MNB, talked about the potential impact of central bank digital currencies on money creation and the financial system. He demonstrated that a change in format, i.e. a central bank currency available to the public in digital form may potentially bring about some changes in content. After a short endogenous money theory introduction, Szabó said that over the past years a number of reputable researchers, including Michael Kumhof and several of his co-authors, demonstrated money creation in the banking system through lending. He also pointed out that the banks´ money creating capacity is attributable for the most part to the fact that only the money created by banks is available in digital form to households and companies. Because the central bank currency is not competitive in terms of form, the money created by the banks is converted less and less to central bank money (to cash). Not necessarily, but all of this may change if a central bank currency became competitive also in terms of form, similarly to the money issued by commercial banks. This is because in this case part of the deposits created in the course of lending could leave the banking system and migrate into central bank money.[2] But this may place the banking system in a position – especially if commercial banks have no or only limited central bank resource availability – whereby it can only land money if it has preliminary savings, term deposits and investments. Therefore in an extreme case – should sight deposits kept by the banks completely migrate into central bank digital money and there would be no central bank availability – the introduction of central bank digital currency may lead to a system similar to a sovereign money system, where the money is created by the central bank while the banking system is the intermediary of the existing savings. Szabó emphasised that the impact of central bank digital currency on money creation, lending and the financial system and the inherent challenges have already been evaluated by several central banks. Szabó also called attention to the fact that a change in money creation is not a necessary component

[2] The speakers' opinions are not uniform in that respect. In his model, Kumhof assumed that bank account money will first be fixed in the form of government bonds at the State Treasury and can reach the central bank from there to be sold against digital money. But it is important to see that in Kumhof's model, money continues to be created by commercial banks in the course of lending, and the central bank is available for the population as an option through the above mentioned transaction, i.e. the central bank does not create new purchasing power (in the "pecuniary" sense), it merely provides special liquidity for society.

of the introduction of central bank digital currency; the central bank may decide on the conditions of the central bank digital currency and the central bank´s availability and may shape these in such a way that their impact on money creation is limited. Finally – as observed by previous speakers – Szabó emphasised that exploring the effects of the introduction of central bank digital currency requires extremely complex research work; some central banks, for example the Bank of England and Riksbank had made significant progress, but for the time being the critical part of research work is yet to come.

The second section focused on Bitcoin and other altcoins. The first speaker of this section was *Antal Kuthy*, a recognised expert in the field of cryptography, founder of E-Group, a supplier to China Union Pay among others, who presented in detail the technology behind Bitcoin. He demonstrated that one of the strengths of Bitcoin is that it combines in a single applicable use many, already partially existing novelties available in different areas. The technology combines the building of consensus, distributed registration and encrypted procedures. Kuthy emphasised that the technology is not identical with cryptocurrencies but goes far beyond them. The registration of money is only a narrow field among the possible fields of utilisation. Blockchains may store not only numbers representing money, but also any other information such as contracts acting as programs. Kuthy stressed the Ethereum Project which has the objective of broadening the areas of application, i.e. providing a framework that can be applied by any utilisation working on distributed ledger basis.

Kuthy's presentation was followed by *Ken Lo*, the CEO and shareholder of the Hong Kong-based ANX Bitcoin exchange, with over 1 million members from more than 50 countries. Ken Lo emphasised that there is currently a significant "hype" surrounding not only Bitcoin but all other altcoins (Ethert, Ripplet and the other 1,200 cryptocurrencies). The exchange rate is extremely volatile, and huge price fluctuations are possible within a few days or possibly even within just a few hours. A few years ago cryptocurrencies were considered as a toy of some IT geeks, but this has changed by now. The fact that the capitalisation of cryptocurrencies already exceeds USD 200 billion makes it impossible not to consider them. There is substantial media coverage which supports the popularity of cryptocurrencies, but the fact that the CME (Chicago Mercantile Exchange), the US options and futures exchange, will list Bitcoin among its tradable instruments is maybe the most significant piece of news. Currently, the majority of large investors do not have access to Bitcoin, but through CME practically every major investor in the world will have access to this market which may result in substantial additional buying power. In addition to cryptocurrencies, Ken Lo also presented a new application area of the technology in the financing of innovative investments. While in the past the main financers of innovative and risky investments were venture capital firms, now the

ICO (initial coin offering) may offer a new way in this field and in crowdfunding. The owner of an idea may be able to raise funds simply and globally by issuing its own currency (coin) and use such currency to finance its business. The advantage of this solution is that it can be resolved in a simple manner without any agents, the coin is easily accessible and can be easily sold later on the secondary market. However, this new form of fundraising does not relieve the investors from having to evaluate the actual project, as it may still carry high risks irrespective of the form of financing. And without market makers, completely unrealistic base prices and broad exchange rate movements may occur.

The second section was closed by *Michal Vodrážka*, Director at the Czech National Bank in charge of financial infrastructure. In his presentation, he described the official standpoint of the Czech regulation on Bitcoin and other altcoins. Vodrážka mentioned that for the time being this regulation treats cryptocurrencies as a rather insignificant matter, but that they are closely monitoring their evolution. The Czech National Bank does not consider virtual currencies as actual money, credit institutions are not allowed to trade in such instruments and their banking license do not extend to them. The regulation, governing the prevention of money laundering and terrorist financing analyses the related activities in detail. However, the speaker remained sceptical regarding the necessity of a major regulation on virtual currencies on top of the mentioned money-laundering issues, in addition to having drawn the attention to the serious risks related to virtual currencies. Although a small community is extremely committed to virtual currencies, they play a marginal role in transactions for the time being: in the Czech Republic only 160 stores accept these instruments.

The conference proved to be extremely successful based on the feedback of both the participants and the speakers. The presented topics were discussed from several aspects, thus generating substantial added value and new knowledge. The complexity of the topic and its increasing popularity suggest that this event – together with the research – may well have a continuation going forward.