SJPPPA Slovak Journal of Public Policy and Public Administration
sjpppa.fsvucm.sk ISSN 1339-7826 (online)


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# EU: CRISIS MANAGEMNET TRENDS IN THE DIGITAL AGE

**Abstract**
The 2008 financial crisis has affected the European Union's economy. The past two decades are characterized by the aspiration to exit the financial crisis and toreach the economic stability. However, in recent times, with the development of digitalisation, it may be necessary to review the area of crisis management specific to the digital economy to prevent further adverse consequences may originate from the development of digitalisation. In connection with the above, in the area of cryptocurrencies, it is necessary to consider not only potential risks for economic stability, but also on cyber- and hybrid threats. This paper focuses on centralized and decentralized EU crisis management trends, and analyzes them from the perspective of future crisis-prevention at an EU level. In order to achieve its goals, this paper considers the financial crisis management techniques developed until today, and then explores the issue of Bitcoin and crypto assets, and cyber security issues.

**Key words:** crisis, Bitcoin, cryptocurrency.

## 1 INTRODUCTION

The financial-economic crisis started from the United States of America has not only led to the economic recession of some Member States, but also had an adverse affect on the economy of the European Union as a whole. Andor states that the crisis has caused so great economic instability that can be interpreted as the deepest recession of the post-war era (Andor, 2013).

In the post-crisis period, a specific distinction should be made on the topic of crisis management techniques based on regulation.

In cases, where these techniques are regulated by the European Union or any institute or organ, a traditional crisis management trend may be considered, while in other cases, where these techniques are executed by peers, an alternative crisis management solution should be considered. Based on the above distinction,

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centralized and decentralized crisis management solutions should be considered, where centralized crisis management solutions may be considered traditional, regulated and institutional, and decentralized crisis management solutionsmay be considered peer-to-peer, technological and most of the cases, outside the scope of the regulation.

## 2 CENTRALIZED CRISIS MANAGEMENT SOLUTIONS

Centralized crisis management trends should be considered institutionalized crisis management solutions made by or related to the European Union. Actually, crisis management trends, in which the role and decisions of a central player is significant should be taken into account in this category.

In case of centralized crisis management solutions, subcategories mayalso be made on the basis of the bodies responsible for decision making. The categories of central players may contain Member States, international organizations and the European Union.

### 2.1 Crisis management by the Member States and international organs

In order to eliminate the negative economic situation emerged; the Member States affected by the crisis have used an expansive anti-cyclical fiscal and monetary policy. In parallel, the revision of the financial system regulation has been made (Andor, 2013).

Amongst the crisis management techniques, Member States also devoted particular attention to issues affecting the financial system. Priority was given to stabilizing the banking system and restoring its operational capability (Andor, 2013).

Co-operation between international organizations has become tighter, as a result of which the IMF or the G20 have become active participants in crisis management (Andor, 2013).

### 2.2 Crisis management by the European Union

Crisis management solutions have also been established in the level of the European Union.

The European Economic Recovery Plan (EERP) was presented by the European Commission and then accepted by the European Council in 2008.

The EERP lays down how the Member States and the European Union should coordinate their policies. As the first pillar of EERP, Member States had to support consumer demand by 1.5% of their GDP in full respect of the Stability

and Growth Pact (Andor, 2013). The second pillar of the EERP covers "smart investments": the launch of energy efficiency projects for job creation and energy saving, investments in technologies that are indispensable for the creation of future vehicles, and investing in the information infrastructure (Győrffy, 2013).

As far as crisis management is concerned, the establishment of crisis management funds should be considered an important step under the scope of economic governance. The European Financial Stability Facility (EFSF) set up in 2010 should be considered such a temporary financial assistance solution, which was used under strict conditions by the eurozone Member States to solve financial difficulties (Győrffy, 2013). The European Financial Stabilization Mechanism (EFSM)should also be considered such a temporary crisis management solution (Győrffy, 2013; Andor, 2013).

As a permanent solution, the European Stability Mechanism (ESM) was established in 2012, which can provide support under a strict framework of € 500 billion (Győrffy, 2013; Andor 2013).

Apart from the establishment of crisis management funds, an institutional reform has been established, that should be considered an important step in the European Union.

In 2010, the European System of Financial Supervision (hereinafter referred to as 'ESFS') was set up (European Central Bank, s.d.). The ESFS includes the three European Supervisory Authorities (hereinafter referred to as 'ESAs') and the European Systemic Risk Board (hereinafter referred to as 'ESRB') (European Commission, s.d.). The ESAs' bodies, which have been established for the proper regulation of the financial sector,are the European Banking Authority (hereinafter referred to as 'EBA'), the European Securities and Markets Authority (hereinafter referred to as 'ESMA') and the European Insurance and Occupational Pensions Authority (hereinafter referred to as 'EIOPA') (European Commission, s.d.).

The EBA is responsible for supervising the banking system, ESMA is responsible for supervising money and capital markets, while the EIOPA is responsible for supervising the insurance sector and occupational pensions. The ESRB is responsible for measuring systemic risks in the financial system (Andor, 2013).

Among the EU-wide crisis management practices, it is also necessary to mention the so-called "European Semester" established in 2010 by the Commission, as a tool of strengthening economic governance (European Council, s.d.). The essence of the European Semester is that the Member States could harmonize their fiscal and economic policies with the purposes and rules adopted at an EU level in a year-to-year, ongoing winter-to-summer process (Andor, 2013; European Council, s.d.).

In the area of crisis management, it is necessary to mention the Euro Plus Pact signed in 2010 (European Commission, 2015). Beside this, legislative

packages on economic governance have a significant role. These are the so-called "Six Pack" adopted in 2011, and the so-called "Two-Pack" which have intensified the rules of the Stability and Growth Pact and its application (European Council, s.d.).

In addition, the Commission has initiated new legislation on banks' capital adequacy, limitation of money market and capital market derivatives, and separation of various financial activities and the functioning of credit rating agencies (European Council, s.d.; Andor, 2013).

In 2010, the Europe 2020 strategy was established. The Strategy focuses on smart, sustainable and inclusive growth in terms of long-term economic growth and sets out priorities (European Commission, 2010).

In addition of the above, the activities of the European Central Bank are of the utmost importance when considering crisis management on an institutional level. Measures of the ECB include the introduction of the government securities purchase program and the introduction of three-year collateralized lending (Győrffy, 2013).

In 2010, the European Systemic Risk Board was established to monitor and evaluate possible risks arising from macroeconomic developments and other risks in the financial system (1092/2010/EU).

The Treaty on Stability, Coordination and Governance in Economic and Monetary Union was signed in 2012 and aims to strengthen fiscal discipline (European Council, s.d.; Győrffy, 2013).

In addition, the creation of the troika can be interpreted as such a crisis management technique in which the European Commission togethter with the European Central Bank (ECB) and the International Monetary Fund (IMF) developed and supervised the adjustment programs of the countries need of assistance (Andor, 2013).

Between 2011 and 2013, the EU has introduced stricter rules to monitor government debt and budget deficit in each country (European Union, s.d.).

The Resolution Directive (Directive 2014/59 / EU) entered into force in all EU countries in July 2014. It sets out a number of rules regarding the coordination and improvement of instruments to facilitate the management of EU banking crises. For the euro area countries, a Resolution Fund was established in 2016.

The Deposit Guarantee Schemes Directive (2014/49 / EU) entered into force in 2014, confirming the ability of existing national deposit guarantee schemes to react to the deficiencies identified by the financial crisis.

## 3 DECENTRALIZED CRISIS MANAGEMENT SOLUTION

In parallel with regulated solutions, a crisis management technique that focuses on consumer confidence has also been established.

Considering confidence, it should be noted that it plays a significant role in the functioning of the economy, especially in the financial sector. To take an example, the failure of consumers' confidence in the financial sector may start with badly-managed credits, poor outsourcing, which may lead to insolvency of banks and to the loss of capital. The lack of confidence in banks may lead to liquidity shortages and create a so-called 'crisis of confidence' in the financial system (Kosztopulosz, 2012).

The 2008 economic crisis is often called the crisis of confidence. As a consequence of it, a specific process has begun in the area of consumer confidence, which has resulted in paralysis of financial markets, the collapse of funding sources and the demand of real economy activity(Bagó, 2009.).

In the aftermath of the crisis, Satoshi Nakamoto published his White Paper in which he establishes a digital payment instrument, called the Bitcoin, and its technical rules (Nakamoto, 2009). Bitcoin is considered to be an alternative crisis management technique by a majority of people. By examining this approach, Bitcoin offers alternative financial solutions to financial consumers who lost confidence in banks. In addition, no central player is involved in these transactions; transactions are executed by peers.

All this means that this alternative crisis management solution may be considered decentralized, as follows:

### 3.1 Bitcoin

Essentially, Bitcoin is a digital asset created and recorded electronically; has neither a real issuer, such as the euro, nor a printed version. The way Bitcoin is established is the so-called mining process. The term mining means the use of computer software to solve mathematical problems (Gábor–Kiss, 2018).

Bitcoin is characterized by a number of specialties. Decentralized system, cryptography, anonymity, validation and mining should be considered such basic features of Bitcoin. These specialties can properly be determined by comparing them to traditional bank-based financial transactions.

As regards the decentralized system, Satoshi Nakamoto laid down an image of a system in which there is no central player, i.e. an image of a peer-to-peer network, characterized by publicity. In case of Bitcoin payment transactions, payment systems operated by central counterparties are not included in the transaction. Transactions are instantaneous, are not under the influence of any central bank and are characterized by low transaction costs (Gábor–Kiss, 2018; Brühl, 2017; Eszteri, 2012).

The system uses cryptography. Each transaction is implemented in the system by sending the cryptographic keys of the users to carry out the transactions. Due to the use of asymmetric cryptography, Bitcoin transactions are characterized

by anonymity. Unlike traditional banking, in case of Bitcoin transactions, the users' personality is in secret, while transactions are open to the public, and DLT technology makes transactions transparent (Eszteri, 2012).

In case of traditional transactions, the operation of online accounting schemes requiresdata transmission and validation. Validation in Satoshi Nakamoto's solution means using time stamp in each transaction. The aim of using time stamp is to ensure systemic stability and to secure bookkeeping. In centralized system, it is the central players' obligation to ensure that a given amount of money can not be used more than once. In case of Bitcoin, this function is implemented by the users of the decentralized system. Miners are those who examine pending transactions and ensure that an amount can not be spent twice, and it is also their responsibility to grant the transfer to be executed and the proper functioning of the specified operating rules (Gábor – Kiss, 2018; Brühl, 2017; Eszteri, 2012).

### 3.2 Bitcoin as a cybersecurity threat

Considering the European Digital Economy, the EU has a strategic interest in developing technology tools to protect both the digital economy and the security. According to the Commission's report, digital threats are spreading rapidly. While virus attacks have risen by 300% since 2015, the economic impact of cybercrime has increased fivefold between 2013 and 2017. According to the Commission's report, it may show an additional fourfold increase for 2019 (JOIN/2013/01 final).

This entire means that, even if we accept the view that Bitcoin is an alternative crisis management technique, it may serve as a source of cyber security issues.

According to the NIS Directive, cyber security means 'the ability of network and information systems to resist, at a given level of confidence, any action that compromises the availability, authenticity, integrity or confidentiality of stored or transmitted or processed data or the related services offered by, or accessible via, those network and information systems', an incident means 'any event having an actual adverse effect on the security of network and information systems' and a risk means 'any reasonably identifiable circumstance or event having a potential adverse effect on the security of network and information systems' (NIS Directive, 2016). On the basis of the above, a hacker attack should be considered a cyber-security incident or a risk.

In case of Bitcoin, it should be highlighted that these transactions can easily be applied to cybercrime due to the anonymity of the transactions.According to a study (Department of Homeland Security), 33% of Bitcoin-traded platforms have already been hacked. In addition, Bitcoin and other cryptocurrencies are able to be used in a manner of cybercrime, due to unregulated, decentralized and anonymous

characteristics. Suffice is to say that the Dark Web, where payments are usually associated with anonymity, and is typically connected to illegal activity (CCN, 2016).The cyber security risk originates from Bitcoin should be exemplified by the activity of a hacker group (Armada Collective) which attacked banks in Greece in 2015, and demanded hundreds of thousands euros in Bitcoin.Other risks were embodied in case of the WannaCry ransomware, where payment in Bitcoin was demanded.The WannaCry ransomware has attacked Britain's National Health Service, some Spanish companies, such as Telefónica, or Russian, Ukrainian and Taiwanese computers (Guardian, 2017).

### 3.3 ENISA

In the field of cyber security, the European Union Agency for Network and Information Security (hereinafter referred to as 'ENISA') has a major role.

ENISA is contributing to a high level of NIS Directive within the EU. ENISA works together Member States, the Committee and other agencies to prevent cyber-security incidents and crises and to establish appropriate responses to their occurrence. ENISA's cyber security and crisis management activities include crisis simulation, training, support for crises and architecture of Member States, international conferences and studies (ENISA, s.d.)

ENISA also deals with Bitcoin and cryptocurrencies. According to its study, virtual currencies can be categorized into various subcategories. *„Virtual currencies can for instance be convertible, meaning they can be directly exchanged for "real"currency by virtual currency exchangers, or non-convertible, meaning they cannot be exchanged for real currency. Furthermore, virtual currencies can be centralised, meaning they have a single administrating authority, or decentralised. ENISA considers cryptocurrencies as a subset of virtual currencies that are used in a decentralised manner, using for example Blockchain technology. A proposed definition for cryptocurrency is: "Cryptocurrency refers to a math-based, decentralised convertible virtual currency that is protected by cryptography.—i.e., it incorporates principles of cryptography to implement a distributed, decentralised, secure information economy"* (ENISA, 2017).

According to the study of the ENISA, a large amount of risks may originate from cryptocurrencies, such as the risk of key and wallet management, cryptography risks, attacks on consensus protocol, distributed denial of service (DDos), smart contract management, illegal use, privacy, or addressing future challenges such as quantum computing (ENISA, 2017).

The ENISA study also defines the current regulatory environment of cryptocurrencies, where anti-money launderingand terrorist attacks take an important place.

### 3.4 Anti Money Laundering Directive 5

In the field of cyber security risks arising from Bitcoin, the Directive (EU) 2018/843 of the European Parliament and of the Council of 30 May 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for money laundering or terrorist financing, and amending the provisions contained in Directives 2009/138 / EC and 2013/36 / EU (hereinafter referred to as 'AMLD5') should be considered.

AMLD5 is the main legal instrument for preventing the use of the EU financial system for money laundering and terrorist financing. The Directive lays down a legal framework by requiring Member States to identify, interpret and mitigate the risks of money laundering and terrorist financing. As stated in the Directive, recent terrorist attacks have shown new tendencies in which terrorist groups finance and implement their operations using alternative payment solutions. As for an example, the use of modern technology services as alternative financial payment methods,such as Bitcoin, is a typical practice in case of cyber crime (AMLD5).

In addition to the risks presented, AMLD5 refers to financial innovations, establishing the legal concept of "virtual currency";as a specific unit of law and technology.

Under the scope of the AMLD5, "virtual currency" 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'(AMLD5).

In parallel, a special harmonization of the centralized and decentralized models may appear.

### 3.4 Comparison of the centralized and decentralized model

There are similarities and differences between centralized and decentralized (or traditional and alternative) crisis management techniques.For both types of crisis management techniques, a common element may be identified, that is theconfidence in the financial system.

However, while the centralized crisis management solution targets to consolidate and maintain confidence by setting up individual guarantee institutions, the decentralized crisis management solution targets to establish a new type of, so to say, quasi-financial system.

Another difference between the two models may be identified. While the centralized model seeks to provide guarantees via legal instruments, the

decentralized model tries to establish a stable and resistant system due to the possibilities provided by technological standards.

The complexity of the situation is well illustrated by the fact thatin 2018 all three ESAs issued a joint warning referringBitcoin transactions.

According to the EBA: *„ The VCs (...) are highly risky, generally not backed by any tangible assets and unregulated under EU law, and do not, therefore, offer any legal protection to consumers."* (EBA, 2014). *„ The three ESAs are concerned by the fact that an increasing number of consumers buy VCs particularly with the expectation that the value of VCs will continue to grow but without being aware of the high risk of losing their money invested."* (ESMA, 2018).

Warnings of the three ESAs are also of the utmost importance because in a situation where financial consumers lost their invested assets, loss in consumer confidence could start.

This problem also highlights the detrimental consequences of the lack of a complex regulatory system or of the lack of a guarantee structure.

## 4 CONCLUSION

In view of the above, it can be concluded that,in case of Bitcoin and other cryptocurrencies, an economic situation has establishedthat is outside the scope of a complex regulation. Although the European Union has developed a complex regulatory system in the area of financial crisis management, cryptocurrencies do not fall under the scope of it.

Additionally, Bitcoin and cryptocurrencies may also lead to cyber security risks. It is easy to see that Bitcoin and cryptocurrencies, as results of intense innovation efforts in the 21st century, establish a situation in which law and technology are in conflict. However, this conflict is not irresolvable. AMLD5 may be considered as a kind of a harmonization in these areas.

However, it may be a question of whether the law is able to regulate the achievements of 21st century technology; and if so, then it can provide adequate protection for financial consumers.

Although the answer to the question goes beyond the boundaries of this study, it will certainly be an important part of future legal literature and legislation.

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