RISK MANAGEMENT AND ACCOUNTING WITH FINTECH

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Abstract

The reporting and organization of accounting activities are changing with the advent of new FINTECH technologies in our daily life and the business environment. And, in particular, new technologies provide new opportunities for the development and improvement of the accounting organizational structure in individual enterprises. This report presents new opportunities related to artificial intelligence technologies for managing accounting documents, providing accounting services, and risk management. We can conclude that potential blockchain applications are important, especially in financial and accounting services, where cross-border payments are already implemented.

Keywords: FinTech, accounting, risk management

JEL Codes: G32, M41

1. Introduction

Over the past few years, there has been a boom in the development of FINTECH technologies. The term "FINTECH" has been defined in the EU as "technology-oriented financial innovations that can lead to new business models, applications, processes or products related to them, material impact on financial markets and institutions, and the provision of financial services". Due to new technologies, accounting is also changing, as well as a new organizational structure, namely, cloud accounting. On the other hand, the prevailing definitions of the concept of risk emphasize the negative consequences and losses of its possible implementation. Risk management is very important for modern companies. The use of blockchain technology in the field of risk management can

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reduce risk generation to some extent and even eliminate it in some cases. Many organizations consider the blockchain as the fundamental technology of risk management.

2. Literature review

Valkanov (2019) treats the interaction between financial institutions and compliance orientated technological innovations outlining three possible perspectives for future development. According to Valkanov (2019), the application of blockchain-based technologies, artificial intelligence, and big data is gaining more and more popularity in different segments of finance, including the regulatory related areas. What is more, the appearance of RegTech firms changes the traditional model for the treatment of regulatory-related issues by financial intermediaries themselves, introducing the opportunity for cooperation with external providers of technological expertise. Radilov (2019) claims that in the digital economy an important position is occupied by the knowledge economy, which will develop and dominate throughout the entire 21st century. Additionally, under it, the most important resource and true wealth will be people themselves with their knowledge, intellect, and experience. Zacharoula (2019) argues that nowadays, innovation has a profound impact on every organizational system, on any industry and the same seems to apply to educational systems of any level.

Zacharoula (2019) explores the higher education in Greece, as applied today and in the forthcoming years and the aim of her study is ternary; firstly, the research on the implementation of international innovation indicators in education, secondly, the mapping of the school organizational culture, and finally, the correlation between innovation and school culture.

Petrova (2018) claims that new FINTECH technologies will significantly change accounting, and accounting will move to the next level of automation-cloud accounting. Besides, accounting must be rationalized and constantly adapted to the needs of the environment and consumers. Also, the accounting profession is going out of the dogma, and its implementation requires some additional knowledge (Petrova, 2018, pp. 246-247). Semova et al. (2018, p. 274) argue that the blockchain functionality changes the technology for entering, processing, storing, and exchanging data (including accounting), by creating a public registry and allowing transactions to be concluded without intermediaries and with appropriate parameters.

Larsson et al. (2018) summarize and analyze the responses of a survey conducted among FINTECH executives in Sweden. Those that offer FINTECH
services in the field of accounting and processing of accounting documents indicate that the main difficulties they face are related to the recruitment of qualified and trained managers, as well as the legal framework. Additionally, executives say that the biggest challenges they face are finding funding and changing the way their clients think and work. Sweden is actively working to change consumer attitudes to be able to work with new accounting products and services, as well as to change the legal framework in the country (Larsson et al., 2018, p. 404). Yermak (2017) shows how blockchain technology can be used in financial market analysis, providing transparency, liquidity, and real-time placement. It presents a variety of opportunities for outsourcing the audit of transactions with shares through the use of blockchain technology. If we assume that the blockchain technology accurately and correctly identifies the holder of shares, then the issuing company will be able to identify unfavorable positions. (Yermak, 2017, pp. 7-31).

Ionescu et al. (2013) examine the activities of Romanian accounting companies that develop and actively offer cloud-based accounting applications. These companies provide accounting services without making accounting documents on a paper basis, and certain accounting operations are performed on platforms based on cloud technologies. It has been empirically proven that cloud-based accounting applications reduce the costs of Romanian companies that use them, resulting in significant financial savings and reduced additional costs (Ionescu et al., 2013, pp. 1-21). Tapscott and Tapscott (2017) explore how blockchain technology can change organizations. In particular, they analyze changes affecting the following activities: financing; management; creating value; marketing; accounting; staff incentives. They conclude that new technologies, including cloud services and blockchain technologies, will allow cooperatives to distribute overhead costs, eliminating mid-level managers and other intermediaries and thereby reducing the activities of businesses in other areas such as accounting, banking, etc. (Tapscott and Tapscott, 2017, pp. 10-13). Kai (2018) reviews the literature and summarizes the results of 402 scientific articles in the field of FINTECH technologies published for the period from 2010 to 2018. He concluded that only 68 of these scientific publications are in the subject of research of blockchain technology in business, including areas such as accounting/audit, management, organization, and finance. Most of these studies present blockchain innovations in the business environment and /or generalize business applications using blockchain technology. Very few of them are studies that are at the descriptive level, analyzing new theories and moments underlying the blockchain phenomenon (Kai, 2018, pp. 15-16). Ozdemir and Elitash (2015)
argue that there are risks of using cloud technologies in the accounting sector. Accounting service providers are responsible for storing and protecting digital financial data, which is extremely important for companies. Service providers must take all necessary technical measures to ensure that digital data is not damaged, lost, or stolen by third parties. FINTECH companies that offer cloud-based accounting services must build the necessary infrastructure and models to predict the overall risks of cloud technologies and successfully store enterprise digital data in a secure and secure environment (Ozdemir and Elitash, 2015, p. 58).

Gerunov (2019) presents the high relationship between the different types of risks and significant overlap between some of them. Also, this assumes comprehensive consideration of the risky impact of modern organization and a unified approach to its management. What is more, effective risk management is required as an important source competitive advantage of modern organizations and, therefore, as an important and current research topic.

Risk accompanies financial markets. This is related to the disclosure of financial instruments that are necessary for its efficient and optimal management. The concept of risk in economic literature implies different content and determination. Risk management in a dynamic financial environment becomes a challenge and a core mission for all countries, organizations, and institutions. Often, the main aim of the risk management process is to evaluate and manage risk, rather than to avoid and eliminate it. There is a risk where more than one result can be realized (Galits, 1994). Risk is "objective uncertainty manifesting as an unwanted event. Risk is a complex of dangers and it is measured by probabilities." (Uils, 1994). Risk as an economic category "expresses the likelihood that the final result of a process will deviate from the expected one or when a statistical approach is used, the risk expresses a possible deviation from the expected average" (Tsenkov, 2017). The definition of a risk situation involves the availability of alternative outcomes. Whenever there is a deviation from the expected result, there is a risk regardless of whether the deviation is positive or negative compared to the expected result. This generally means that the term "risk" is not limited to potential loss. "Risk" may be associated with the likelihood of undesirable and adverse changes. These are in fact cases where negative deviations from the expected return are realized and are defined by the term downward risk. The risk is generally the likelihood of loss or damage (Stateva, 2015).

Jorian (2007) determines risk as “the volatility of unexpected results that represent the value of assets, equity, and income”. According to him, as a
qualitative characteristic of risk, it is possible to determine the volatility of return. Risk is an objective phenomenon and as such it is inevitable, it cannot be eliminated, but it can be limited, transferred, divided, covered. Simeonov (2005) defines financial risk as "related, in particular, to the probability of factors that will reduce or destroy the expected income. In general, however, the risk exists in any uncertainty situation - regardless of the specific ex-ante evaluation of the desired or undesired outcome. In the same way, no risk is taken into account in the safe development of events, whether they are desired or unwanted."

In his study, Ganchev (2010) states that: “All financial theories, explicit or implicit, include hypotheses about the impact of risk on economic agents' assessment of the utility (or negative utility) of expected income (loss). The general principle is that risk diminishes utility (so-called risk aversion).” In one of his recent studies, Ganchev (2017) concluded that risk is a necessary parameter that makes the existence of complex economic systems possible, since the construction of "secure" structures is impossible, i.e. risk and uncertainty are important and the macroeconomic aspect is positive despite the likelihood of micro-level losses. When the risk is defined, it aims to eliminate volatility, and what is made to replace the various possible outcomes with one sure result. Accordingly, appropriate alternative risk management tools and techniques are selected for this purpose, which includes an obligation to perform a future fixed-line transaction. Risk can be defined as a combination of the following aspects: the likelihood of a particular event to occur, which can be defined as having an unfavorable and favorable outcome; uncertainty about future cash flows, and consequences of event realization (figure 1).

**Figure 1.** The theoretical content of risk concept

![Risk Concept Diagram](image)

*Source: Andasarova-Georgieva (2015, p. 9)*
Risk is:
1. The result of an objective and inevitable event that corresponds to a utility decrease;
2. The realization of which is a deviation from the expected result;
3. Expressed in the occurrence of undesirable and adverse effects which, in the scope of this study, represent an increased likelihood of bankruptcy or insolvency of the state.

The definitions of the concept of risk emphasize the negative consequences and losses of its possible realization. Risk management is very important for FINTECH companies. The application of blockchain technology in the field of risk management can reduce to some extent the generation of risk and even eliminate it. Many organizations view blockchain as a major risk management technology.

3. Discussion and results

*Blockchain* is a constantly growing list of digital records in packages (called blocks) that are linked and protected by cryptography. These digital records - "blocks" - of data are stored in a linear chain. Each block in the chain contains data (such as a bitcoin transaction), is cryptographically hashed and stamped. Each block of hashed data pulls the information from the previous block (the block that precedes it) into the chain, ensuring that all data in the entire blockchain is not modified and tampered with. A special case of using blockchain technology is a product created on its basis - cryptocurrencies. For the first time, the world became aware of Blockchain thanks to the creation of Bitcoin. In 2008, it was invented by an unknown programmer (or group of people) under the name Satoshi Nakamoto. During the launch of the platform, he published a document explaining in detail the ideological, technical, and mathematical principles of the platform's operation. Blockchain is a decentralized technology. Decentralization is a process of redistribution or assignment of powers or functions concentrated in a central place or a central authority. The opposite process is called centering (or "concentration"). Everything that happens in it is a function of the network as a whole (Figure 2). As a result of creating a new way to verify transactions, some aspects of traditional trading may become redundant. The global network of computers uses blockchain technology to share Bitcoin transaction database management. Cryptocurrency is controlled by its network, not by a central authority. Decentralization means that the network operates as a peer-to-peer (P2P) network.
Blockchain operates as a ledger where information is stored in ledgers or registers, distributed among many and different users. This makes the system decentralized because there is no single storage or depository for transactions and information. Each new information and transaction is added to a new layer of the chain, which is verified with a cryptographic signature. The input data cannot be changed, only new information can be added. This increases the confidence among the participants in the chain. A blockchain is a long-growing list of records that are called blocks. They are connected and they are encrypted. Typically, each block contains a hash pointer that connects it to the previous block, and it also contains a timestamp certificate and transaction records that are stored in the block. It is extremely difficult to modify the data that blockchain technology creates and contains. Each block contains the following elements: hash, data (information), hash from the previous block.

**Figure 2.** A centralized and decentralized system

**Source:** https://en.wikipedia.org/wiki/Decentralised_system

**Figure 3.** Block content

**Source:** https://www.youtube.com/watch?v=SSo_EIwHSd4
The data in the block depends on the type of blockchain. The whole transaction is aggregated into a single string. The so-called hash function is used. Thus, the transaction receives a unique code that cannot be duplicated and can be identified by it. We can compare it with a fingerprint. It identifies the block and all its contents. The hash is also calculated when the block is created. The block change will result in a hash change. The first block of the chain is special. It does not contain information about the other blocks in the chain (hash). It is called a genesis block. The following blocks contain data that can block the information of the previous blocks, i.e. the hash is used for protection.

Blockchain technology is based on the process of encryption information that is performed by the integrated computers from the network. All information is distributed among network members based on a principle similar to torrent file sharing. Hashing is a check of the integrity of a digital or alphabet message and it is performed by the use of a special algorithm. By clicking a message through this algorithm, the system participant hashes it – this leads to a hash. If one of the blocks in the chain is falsified or modified, it causes a change in the hash and so changing one block will transform the others into invalid ones.

**Figure 4. Hashing**

Source: https://www.youtube.com/watch?v=SSo_EIwHSD4
In Table 1 we describe the advantages and disadvantages of applying blockchain technology as a major mechanism for managing financial risk.

Table 1. Advantages and disadvantages of blockchain technology

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transparency</strong></td>
<td><strong>Irreversibility</strong> of transactions or transactions</td>
</tr>
<tr>
<td>Each connected block in a common chain is publicly accessible. Each user can check the entire transaction path.</td>
<td>The transfer of information is irreversible. It is impossible to cancel a blockchain transaction, even with an error when programming the operation.</td>
</tr>
<tr>
<td><strong>Decentralization</strong></td>
<td><strong>Scalability</strong></td>
</tr>
<tr>
<td>Each of the nodes which are participating in the network has equal access and ability to transfer data directly.</td>
<td>If at least a small portion of Visa's transactions due to the Bitcoin system, the amount of stored data can reach hundreds of terabytes.</td>
</tr>
<tr>
<td><strong>Reliability</strong></td>
<td><strong>51% Attack</strong></td>
</tr>
<tr>
<td>The operation of the system implies high protection against hacker attacks and data substitution by using special encryption keys.</td>
<td>If the percentage of the computing power of the network which is possessed by one user, exceeds 51%, the integrity of the Blockchain platform may be compromised.</td>
</tr>
</tbody>
</table>

*Source: Authors’ systematization*

Banks play an important role in the financial market, adding more value to money, and maintaining the financial system. As an intermediary, they help generate savings and distribute funds to borrowers. The loan contributes to the banks’ profits, and risk management is the key to success. Credit risk refers to the potential for a loss because one of the parties of the agreement fails to fulfill its contractual financial obligation promptly. Banks are more interested in this aspect when lending to borrowers. Traditional credit risk management typically involves two steps. At the pre-assessment stage, the borrower is evaluated based on historical records and the value of them. After analyzing the level of credit, the bank will recommend appropriate credit services. On the scene after management, banks should periodically monitor the condition of borrowers to make sure everything is in order as planned. If an unforeseen situation occurs, banks should receive an alert and they should deal with the potential loss
Blockchain technology would change credit risk management significantly. First, blockchain makes data more reliable. The block generation mechanism ensures that you do not have to pay a high price to put incorrect information in the chain. Second, the data in the chain is traceable and unchangeable, so all the history information can be extracted, and borrowers cannot manipulate the data to apply for a loan. The effectiveness of blockchain in credit risk management is also determined by the consensus system. Blockchain technology eliminates the need for financial intermediaries. Currently, when doing business with one another, we do not share our private financial or business registers, but rather rely on trusted intermediaries such as a lawyer or bank to verify your identity and documentation. By Blockchain technology, trust is built for users. By using a process called cryptography, the buyer can confirm the seller's identity and that he or she owns the asset.

**Figure 5.** Blockchain network as a substitute for financial intermediaries

![Blockchain network as a substitute for financial intermediaries](https://www.wikipedia.org/)

*Source: Authors' modification based on https://www.wikipedia.org/

Figure 6 shows the results of research conducted among more than 700 small businesses in the United States in 2018 considering the use of FINTECH services in their activities.
The results show that small businesses invest a lot of money and resources in FINTECH services, with the largest expenditures related to accounting services (90% of small businesses use or will use FINTECH-based accounting services over the next 2 years). The main advantages that small businesses expect from the introduction of accounting services based on FINTECH technology are also indicated:

- Reduced time for administrative tasks and activities - one of the main advantages of implementing new technology in accounting is that it makes routine and time-consuming accounting activities, such as posting and filling out payment documents and invoices, more efficient. And, what's more, it saves time, as Getapp's research shows that 37 percent of small businesses in the United States save more than three hours a week using new accounting technology. Also, new financial accounting technologies offer new accounting applications that integrate and link individual data for the respective enterprise.

- Reduce the number of inaccuracies and inconsistencies that occur due to human errors-in each enterprise. For example, you can lose accounting documents, make mistakes in mathematical calculations or accounting data to refer to the wrong column in the corresponding
spreadsheet. In small businesses, operational and routine accounting activities take up most of the time of accountants, and they are more likely and predisposed to making technical errors. Through the use of accounting software based on artificial intelligence, this accounting activity is facilitated, and it draws and calculates the necessary formulas and dependencies. For instance, accounting software based on FINTECH technology easily implements the link between an individual enterprise and a servicing Bank, reconciling Bank account data and those presented in financial reports. Thus, the corresponding amounts of accounting documents are compared, as well as existing errors and inconsistencies that need to be corrected are detected. By importing data from Bank statements and documents to the accounting software platform, accounting information is synchronized, and it takes only a few minutes to compile reports. This process saves significant time for accountants and reduces errors.

- Assistance in the procedure for calculating tax liabilities and completing and submitting the necessary documents to state authorities. Using new accounting technologies, businesses could easily calculate corporate tax arrears. By using FINTECH technologies in accounting, businesses can export electronic files from the platform to the tax authorities. Also, with the development of RegTech technologies, changes in tax legislation and regulations will be automatically reflected in the accounting software used.

- Automatic preparation of financial reports using data from accounting documents. Using FINTECH technologies in accounting, businesses can prepare their annual financial reports, as well as other reports that show limitations in their activities.

On the other hand, with the introduction of FINTECH technologies, a new organizational structure of accounting has also appeared, namely, cloud accounting. Cloud accounting can be defined as a set of accounting services that are performed and available over the Internet. The main advantages of cloud accounting are the following:

1. Security - when using cloud services, new security increases. Internet-based systems provide a better level of security and control than traditional software. Using cloud accounting reduces the costs associated with storing documents on paper, as well as the overall cost of maintaining the accounting Department's workplace.
2. Adaptability and convenience - using this new cloud-based software is much easier than traditional software tools. Also, software updates are performed very easily and often by cloud service providers themselves. Unlike traditional accounting applications, the physical installation of the client’s work computers is not required in cloud accounting, resulting in significant time and cost savings.

3. Simple management - the accounting application provides access to all data from anywhere in the world and the only condition is to have the Internet. Besides, users of cloud accounting services use the same version of the accounting software, thereby eliminating potential problems associated with the incompatibility of different versions.

4. Compliance and reliability - cloud accounting software complies with and reflects all legal requirements, including accounting standards and internal control rules.

5. Availability - employees, suppliers, and customers have access to and can update information from anywhere with secure Internet access without having to be in the office. Cloud services can also be used on mobile devices.

6. Speed - thanks to cloud accounting, you can transfer a large volume of databases in a really short period of time, which reduces time and resources for businesses.

4. Conclusion

Potential blockchain applications are important, especially in financial and accounting services, where cross-border payments are already implemented. Smart contracts, cloud storage with encryption, supply chain accountability, and many other features are likely to be driven by the progress of FINTECH in the coming years. In addition to financial services, blockchain will become the main technology for future risk management. Finance and accounting must do the following: build a blockchain project and make sure that the blockchain applications are running as intended from a financial and accounting point of view.

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