Applications of Blockchain in Taxation: New Administrative Opportunities

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Abstract

The purpose of this article is to consider the prospects of using blockchain technology in taxation.

The article discusses the essence of blockchain and its possible implementation in the tax system. The study focuses on the benefits of blockchain as one of the most promising methods of improving and simultaneously simplifying the tax system for both the state and taxpayers.

The main focus of the study was on the specifics of the implementation of blockchain in tax administration, for example, data structuring, cost-effectiveness, security (fraud detection), decentralized accounting technology (transparency), verification of transfer pricing, and the use of smart contracts. Blockchain can reconstruct accounting and automate the method of payments, transfers, and asset accounting.

In the conclusions, the authors identify such potential advantages of implementing blockchain in tax administration as reducing transaction costs, faster, more transparent, and efficient taxation function.

Keywords

FinTech, Smart Contract, Tax System, Taxpayer, Electronic Payment.
Introduction

The integration of the technology and financial sectors became the basis for the emergence of FinTech, which led to a powerful modernization of the markets for payment, insurance, banking, and investment services. The introduction of financial technology tools in the sphere of public administration has been intensified in recent years. In particular, there are significant institutional changes in the provision of administrative services and social assistance, public procurement, and humanitarian assistance. The application of FinTech achievements is also transforming the field of taxation, providing new opportunities, and creating certain challenges for tax authorities, taxpayers, and governments at the national and global levels (Mosteanu N.R., Faccia A., 2020).

Blockchain is one of the latest technologies that is designed to revolutionize the infrastructure that underlies financial services and many other industries, including the accounting and analytical support system for enterprise management. In essence, the blockchain is a distributed (decentralized) database or, simply stated, a digital journal that uses software algorithms to record and confirm (verify) transactions with a high degree of reliability and protection (anonymity) of information (Setyowati M.S., Utami N.D., Saragih A.H., Hendrawan A., 2020). The transaction record is distributed among many parties, and the information that was recorded at the same time cannot be deleted, changed, or duplicated. All parties that store part of the shared information have their copy of the shared database, but without the ability to individually, or with the confirmation of a certain authorized person (for example, a bank) to change or transfer the data. These pieces of information are called "blocks". It is almost impossible to change the information that is stored in a particular block without changing all the blocks since all the blocks are interconnected. Such databases or digital journals are usually public and transparent.

The introduction of blockchain in various sectors of the economy is one of the most popular methods of improving it, so the tax system is no exception. This technology emerged at a time when rethinking the formation of the tax system following the current trends of the digital age is one of the main conditions for its digital improvement, eliminating any manual processes. The essential characteristics of an effective tax system include such categories as transparency, equality, ease of understanding and use, and security. The widespread introduction of such a FinTech tool as blockchain can lead to an increase in the efficiency of tax administration (Faccia A., Mosteanu N.R., 2019).
The countries of the European Union count on the introduction of blockchain technology as generally accepted to improve the conditions for compliance with tax legislation, improving tax control (PWC., 2017). Most of the OECD member countries are actively implementing modern technological solutions in the field of taxation. High-tech IT developments allow building models for assessing tax risks, using information from several databases simultaneously, applying relevant macroeconomic and industry indicators, etc.

**Literature Review**

There are various approaches to the concept of "tax administration" in the scientific literature (Table 1).

<table>
<thead>
<tr>
<th>Source</th>
<th>Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Shmakova A.V., 2017)</td>
<td>tax administration, which is regulated by regulatory acts in the field of taxation and ensures the taxation of certain objects</td>
</tr>
<tr>
<td>(Kim E.S., Alkina A.I., 2014)</td>
<td>a set of procedures that ensure public administration in the field of taxation; characterized by a targeted focus on the implementation of tax legislation</td>
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<tr>
<td>(Grishchenko A.V., 2015)</td>
<td>the tool through which the tax policy is implemented; includes tools of tax (fiscal) control, including systems created using IT technologies</td>
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<tr>
<td>(Tolkachev O.A., 2014)</td>
<td>an organizational system for the implementation of the state tax policy</td>
</tr>
<tr>
<td>(Goncharenko L.I., Vishnevskaya N.G., 2017)</td>
<td>activities of fiscal authorities aimed at organizing the tax process and monitoring compliance with tax legislation, the correctness of calculation, completeness, and timeliness of payment of taxes, fees, and payments to the budget</td>
</tr>
<tr>
<td>(Malis N I., 2012)</td>
<td>a set of interrelated elements, in particular, fiscal and other central executive authorities as to the governing and tax payments as the managed systems</td>
</tr>
<tr>
<td>(Ilin V. A., Povarova A.I., 2017)</td>
<td>a system aimed at ensuring the timely filing of the state budget in the required amount at the expense of tax revenues with a minimal negative impact on the economic activities of taxpayers</td>
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Thus, it follows from the literature analysis that tax administration is an organizational technology aimed at:

- Control of timely submission of tax reports, payment of tax by the taxpayer;
- Obtaining data on the object of taxation from third-party sources, including for the calculation of taxes and the implementation of tax control;
• Conducting tax audits concerning the correctness of the calculation and payment of taxes.

The report (Deloitte, 2017) suggests using blockchain within the European tax administration system to increase the transparency of transactions based on smart contracts, which automate transactions under certain conditions, in particular, reducing prices below a given level.

Research hypothesis: Blockchain provides the basis for digital tax administration.

Research Problem:

• To identify opportunities for blockchain in the field of improving the efficiency of tax administration;
• To determine the advantages of using blockchain in VAT calculation, transfer pricing verification, and e-commerce taxation.

The article consists of an introduction, a literature review, research methodology, results, discussion, and conclusion.

Methods

The theoretical basis for writing the article was the works of scholars on tax administration and the use of blockchain in the tax sphere.

The study was conducted using the methods of theoretical generalization, comparative analysis, analysis, and synthesis, which allowed identifying the possibilities of using such a FinTech tool as blockchain in the tax administration system based on the generalization of positive experience and identifying the advantages of its use for subjects of tax relations.

The expert survey method was also used in the course of the study. The experts were asked several questions concerning various current ways of using blockchain in the field of taxation; the possibilities of blockchain technology in improving the efficiency of tax administration; the advantages of using blockchain in VAT calculation, transfer pricing verification, and e-commerce taxation.

The expert online survey was attended by 33 experts (employees of tax authorities, employees of IT companies), whose interests include the implementation of blockchain in
the field of taxation. The experts included people whose professional activities had been related to taxation and tax administration issues for more than 10 years.

All participants were warned about the purpose of the survey and the planning of the organizers of the study to publish the results of the study in a generalized form.

**Results**

According to the experts, blockchain could improve tax administration by providing the following opportunities (Table 2).

<table>
<thead>
<tr>
<th>No.</th>
<th>Blockchain opportunities</th>
<th>Characteristics</th>
<th>%*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Structuring data</td>
<td>Data storage, in which all data is structured into virtual blocks and recorded together with transactions. As more data is recorded, more transactions are executed – more blocks are created, each linked to the previous one</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Improving economic efficiency</td>
<td>The use of distributed account book technology reduces the cost of processing transactions and storing data without an intermediary</td>
<td>75%</td>
</tr>
<tr>
<td>3</td>
<td>Security (detection of unauthorized access)</td>
<td>The data stored in the blockchain is immutable. Each block is referenced by a separate string of characters created by the cryptographic hash function, which can take any amount of data as input and produce a series of specified lengths as output. This output of the set length is recognized as a hash. According to one of the respondents (expert 4), &quot;the duty to collect sales tax or income tax may, apparently, completely pass from the tax authorities to the participants of the sharing economy&quot;</td>
<td>65%</td>
</tr>
<tr>
<td>4</td>
<td>Decentralized accounting technology (transparency)</td>
<td>The account book can be shared between a specific group of users connected via a local network or over the Internet. This technology eliminates the need for centralization through an intermediary, allowing parties to securely exchange data and make transactions directly with each other. Blockchain makes fraud and errors easier to detect because the scheme provides clear data about transactions and details in the system</td>
<td>80%</td>
</tr>
<tr>
<td>5</td>
<td>Transfer pricing</td>
<td>Blockchain services transactions and can be applied to transaction taxes such as VAT, income tax, stamp duty, and insurance premium taxes. The system can be further strengthened by transfer pricing. For example, one can capture profits from a transaction database to determine how the profits are distributed among the various components of the business</td>
<td>75%</td>
</tr>
<tr>
<td>6</td>
<td>Smart contracts</td>
<td>Computer programs that assist, confirm, or implement the negotiation or execution of an agreement. Allow for faster and more efficient ways to assess and settle tax liabilities</td>
<td>75%</td>
</tr>
</tbody>
</table>

Note: compiled based on the expert survey; * – percentage of expert mentions.
Discussion

Let us take a closer look at some of the possibilities of blockchain in the field of improving the efficiency of the tax regime.

As the results of the expert survey showed, in the sphere of control over taxpayers, blockchain provides for ensuring the fiscalization of settlement and cash transactions. The main tasks of implementing fiscal functions for registering settlement transactions between business entities are to combat tax evasion. Due to blockchain, tax accounting, control, and information exchange are maintained in real-time. According to one of the experts, "blockchain may become the main means of tax collection in the future" (expert 14).

Expert 17 noted that blockchain can become a reliable tool for tax authorities to detect errors and fraud cases due to open information about the operation on the network. The implementation of transactions by business entities in real-time will help to reduce the time between the reporting of the transaction and the payment of tax.

According to the experts, the use of blockchain in the administration of indirect taxes, in particular VAT, is particularly relevant. The experts noted that VAT is one of the largest contributions to budgets of different levels. For this purpose, the tax authorities are looking for ways to collect it more efficiently to generate higher incomes. In the current state, the calculation of VAT depends on the companies themselves. Since tax returns and compensations are estimated over a specific period, such as monthly or quarterly, calculations are not based on exact transactions but are usually based on arbitrary dates (such as billing dates). Each company shall monitor and document VAT to receive a tax deduction. Thus, according to the experts, the blockchain in the collection of VAT could bring the following advantages (Table 3).

<table>
<thead>
<tr>
<th>No.</th>
<th>Advantages</th>
<th>Percentage*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Real-time mode: Blockchain transactions can be confirmed in real-time, making the actual transaction much faster compared to today's processes involving shares, property, assets, etc. between all parties</td>
<td>80%</td>
</tr>
<tr>
<td>2</td>
<td>One-time use: since the purchase registration is processed in real-time for both the buyer and the seller, there is no possibility of duplicate records</td>
<td>75%</td>
</tr>
<tr>
<td>3</td>
<td>Transparency: transactions performed by smart contracts are obvious and understandable, which reduces the risk of fraud and errors. The system allows processing VAT from a transactional point of view, checking and confirming the actions, participation of the parties, and the admissibility and meaning of the transaction</td>
<td>65%</td>
</tr>
<tr>
<td>4</td>
<td>Digital signature: all transactions must be signed with a digital signature, which makes them more reliable and safe</td>
<td>65%</td>
</tr>
</tbody>
</table>

Note: compiled based on the expert survey; * – percentage of expert mentions
The use of blockchain will reduce tax disputes between regulatory authorities and taxpayers since a significant proportion of them are based on the arguments of the parties regarding the historical aspect of the transactions carried out by the payer (Alkhodre A., Ali T., Jan S., Alsaawy Y., Khusro S., Yasar M., 2019).

In paper (Ainsworth R.T., Shact A., 2016), it is proposed to use blockchain in the framework of the European VAT system to increase the transparency of operations based on smart contracts, which automate transactions under certain conditions, in particular, reducing prices below a given level. The expansion of the use of blockchain in the field of tax administration, in turn, will lead to an increase in the need of regulatory authorities for specialists who can work with this technology.

In Shenzhen, China in 2018, the first implementation of the pilot blockchain system developed by Tencent and the municipal Tax Bureau, which involves the automatic generation of invoices when paying via WeChat, took place. Tencent is partnering with the Shenzhen Municipal Office of the State Administration of Taxation to create an innovative smart tax lab that is designed to modernize tax management and counter fraudulent technologies. The first invoice was issued on August 10, 2018, by a local restaurant (Wang Y., Kogan A., 2018). This innovation allows tax authorities to control the origin and authenticity of invoices, overcoming the problems of excessive reporting.

In the context of transfer pricing, blockchain applies when it comes to the equity of income distribution, considering the place of value creation in the overall supply chain. The transfer pricing methodology, namely the method of profit distribution, involves the argument of the fairness of the distribution of the total income from a particular transaction or group of transactions between its parties, in proportion to the functions performed by these parties, the assets they used, and the risks they assumed (Fatz F., Hake P., Fettke P., 2019).

With the help of blockchain, it is easy to calculate and, most importantly, to record the profit of each party to a transaction between members of multinational corporations (MNCs) from each small transaction in real-time. This allows stakeholders (businesses and tax authorities), on the one hand, to constantly, rather than ex post facto, monitor the level of profit and its compliance with the "arm's length" principle, as well as reduce the cost of preparing transfer pricing reports, and, on the other hand, to solve the problem that is classified as "time constraints" (Nemade A.E., Kadam S.S., Choudhary R.N., Fegade S.S., Agarwal K. , 2019). This often forces payers to be based more on assumptions than on actual data. Also, this approach will allow tax authorities to see in real-time a detailed
picture of value creation (profit distribution) from various types of transactions (deliveries of goods, financial transactions, services with low added value, etc.) in the context of all participants of MNCs and the tax jurisdictions in which they are registered. It will also allow conducting preventive control and quickly adjusting the tax base, as a rule, the process of returning the tax base can be stretched even for several years due to the need for tax authorities, first in the court dispute prove its legitimacy, and then also coordinate tax adjustments to other countries in the framework of the mutually agreed procedure (MAP) (Owens J., de Jong J., 2017).

The experts emphasized that due to the rapid development of e-commerce, it is an important issue for tax authorities to determine the place of taxation of transactions. Also, the practice of qualifying the presence of permanent establishments (PE) is very actively used by tax authorities to protect the tax base of their countries. The OECD has separately identified two steps in the framework of the action plan to prevent the erosion of the tax base (BEPS plan) to improve tax control in these areas, namely:

1. It is proposed to separate the "electronic economy" into a separate sphere and develop its own fiscal rules for it;

Today, digital goods and services offered by non-residents are currently charged an indirect tax: in Australia at a rate of 10%, Japan – 8%, New Zealand – 15%, Taiwan – 5% when purchased via the Internet. In the European Union, suppliers of electronic goods and services pay VAT in the buyer's country. In early 2019, the Government of Chile considered a proposal by the Chilean Chamber of Commerce, the Confederation of Industries and Trade, and the Organization for Economic Cooperation and Development to introduce a value-added tax for multinational e-commerce companies with local operations at a rate of 19%, at which Chilean companies also pay this tax. This applies to companies such as Amazon, Netflix, Spotify, and Uber, which are strengthening their presence in the country (Ølnes S., Ubacht J., Janssen M., 2017).

Blockchain is planned to be used by the tax authorities of many countries to determine the place of profit from e-commerce, which also provides information for assessing the possible status of a PE. For example, companies such as Amazon actively sell products all over the world, while they do not have any divisions or representative offices in many countries, which allows making a profit in these countries without being taxed according to their tax rules. Lawsuits against Amazon and Google over their non-payment of taxes
have initiated work in the European Union to modernize the tax systems of the participating countries to protect tax systems and minimize the risks of non-payment of tax obligations by digital companies and platforms. One of these proposals is the introduction of taxes on the digital economy (Wijaya D.A., Liu J.K., Suwarsono D.A., Zhang P., 2017) (a tax on payments made for the purchase of goods and services via the Internet or a tax on turnover from commercial activities on the Internet) as a tool to prevent such opportunities for digital business.

**Conclusion**

The following conclusions can be drawn.

FinTech tools can be effectively applied at all stages of tax administration and optimize the activities of all participants in tax relations. For taxpayers, financial technologies will help reduce document flow and simplify accounting and reporting. For the tax authorities, the economic activities of payers will become more transparent, the assessment of tax risks will be optimized, and the opportunities for detecting tax fraud will increase. This will lead to an increase in tax revenues to the budgets of all levels.

The introduction of blockchain and other FinTech tools in the tax sphere will contribute to the protection of state interests, ensuring transparency of tax payment control and introducing more effective tax administration mechanisms. Digitalization of the process of servicing taxpayers, in turn, will contribute to an increase in the level of tax culture, which will also significantly contribute to improving tax discipline. The expansion of the use of blockchain in the field of tax administration, in turn, will lead to an increase in the need of regulatory authorities for specialists who can work with this technology.

The potential benefits of blockchain in the field of taxation are lower transaction costs and more orderly, efficient, and effective tax administration. Forming a completely new tax system around blockchain is a complex process that creates the basis for digital tax administration.

The analysis of the international experience of implementing blockchain in the field of tax administration has shown that the introduction of blockchain is a continuous process, the digitalization of the tax system is gaining momentum, and the transition to various forms of electronic tax reporting is also only developing for advanced nations.

Thus, the hypothesis of the study that blockchain creates the basis for digital tax administration was confirmed.
Further research in the field of tax digitalization also concerns the use of FinTech tools, primarily big data, for tax policy development and macroeconomic forecasting.

References


