

UDC 657.6:008

JEL classification: M41, M42, D24

DOI: <https://doi.org/10.35774/visnyk2023.01.050>

Volodymyr MURAVSKYI,

D.Sc. (Economics), Associate Professor,
Professor at the Department of Accounting and Taxation,
West Ukrainian National University,
11 Lvivska st., Ternopil, 46009, Ukraine,
e-mail: vvmur@gmail.com
ORCID ID: 0000-0002-6423-9059

Nadiia KHOMA,

PhD (Physico-Mathematical Sciences), Associate Professor,
Associate Professor at the Department of Economic Cybernetics and Informatics,
West Ukrainian National University,
11 Lvivska st., Ternopil, 46009, Ukraine,
e-mail: nadiiakhoma@gmail.com
ORCID ID: 0000-0003-2981-0296

Roman KALYN,

PhD student, West Ukrainian National University,
11 Lvivska st., Ternopil, 46009, Ukraine,
e-mail: vavanm2@gmail.com
ORCID ID: 0000-0003-2339-8122

Oleh REVEHA,

PhD student, West Ukrainian National University,
11 Lvivska st., Ternopil, 46009, Ukraine,
e-mail: tneubook3@gmail.com
ORCID ID: 0000-0002-6140-8726

**ACCOUNTING AND CONTROL OF INDEBTEDNESS ACCORDING TO
ELECTRONIC PAYMENTS OF FOOD INDUSTRY ENTERPRISES USING
INFORMATION AND COMMUNICATION TECHNOLOGIES**

Muravskiy, V., Khoma, N., Kalyn, R., & Reveha, O. (2023). Oblik i kontrol zaborhovanosti za elektronnyimi rozrakhunkamy pidpryemstv harchovoi promyslovosti z vykorystanniam informatsiino-komunikatsiinykh tekhnolohii [Accounting and control of indebtedness according to electronic payments of food industry enterprises using information and communication technologies]. *Visnyk ekonomiky – The Herald of Economics*, 1, 50–66. DOI: <https://doi.org/10.35774/visnyk2023.01.050>

© Volodymyr Muravskiy, Nadiia Khoma, Roman Kalyn, Oleh Reveha, 2023.

Муравський В., Хома Н., Калин Р., Ревега О. Облік і контроль заборгованості за електронними розрахунками підприємств харчової промисловості з використанням інформаційно-комунікаційних технологій. *Вісник економіки*. 2023. № 1. С. 50–66. DOI: <https://doi.org/10.35774/visnyk2023.01.050>

Abstract

Introduction. *Digitization of socio-economic processes and the implementation of modern information and communication technologies in the currency and banking sphere have led to the evolution of the methodology of electronic settlements with counterparties. The latest stage in the development of electronic transaction systems is the information integration of counterparties into a single information environment of business relationships based on the principles of blockchain technology.*

Purpose. *The purpose of the article is to research the peculiarities of the organization of accounting and control of electronic payments and improvement of their methodology in the context of debt repayment in the conditions of the use of information and communication technologies.*

Methods. *Systemic, innovative, functional approaches and methods of generalization, bibliographic and comparative analysis were used in the process of realizing the established goal of scientific research.*

Results. *It is proved that the fundamental basis of the system of electronic transactions are electronic contracts, which form a database for the digitization of accounting and control processes. A list of permanent and variable accounting data provided by the electronic payment system and the company's divisions for the digitization of accounting for the occurrence and repayment of receivables and payables is proposed. The procedure for internal control of payment discipline and external independent control (confirmation) of business reliability and solvency has been improved with the notification of all counterparties interested in cooperation. A methodology for rating counterparties based on the reliability criterion has been developed to automate accounting for the formation and use of the reserve of doubtful debts. The possibility and expediency of alternate automatic mutual offsetting of receivables and payables between all counterparties of food industry enterprises based on accounting information based on previously executed smart contracts is substantiated. Mutual repayment of debt in the system of electronic transactions contributes to the minimization of the overall level of debt in the economic systems of the association of enterprises of food industry, cities, regions, etc.*

Discussion. *The automatic offsetting of indebtedness ensures the formation of the phenomenon of debt-free (minimally debt) activity of food industry enterprises, which is an important element of the formation of a post-industrial economy and an optimization society, in which all socio-economic processes are adapted to the needs of people, which is the subject of subsequent scientific research.*

Keywords: *accounting, control, digitization of accounting, debt accounting, electronic transactions, enterprises, food industry, information and communication technologies.*

Formula: 0; fig.: 4; tab.: 0; bibl.: 17.

JEL classification: M41, M42, D24.

Introduction. The development of information and communication technologies is primarily reflected in the formation of monetary transaction systems. Local information environments for electronic settlements between participants in contractual relations are already functioning. Counterparts actively use the possibilities of electronic payments without the use of cash, without visiting banks or other financial institutions. Considering the significant advantages of electronic payments, the level of penetration of electronic services into economic and management processes at modern enterprises has reached a maximum in recent years. And if until recently the functions of electronic payments were mainly used by e-commerce enterprises, today all counterparties and institutions make payments in electronic form. Such systems are closely integrated with financial institutions, bank payment systems and acquiring services for settlement with various electronic money.

However, the emergence of a new phenomenon in electronic transactions, which are cryptocurrencies, has intensified research in the field of prospective application of blockchain information and communication technology. The use of blockchain technology creates conditions for the formation of unique global information systems that connect all counterparties in business interaction. Electronic communications in the information environment optimize business interaction between counterparties. It is expedient to organize all aspects of conclusion, execution control and settlement of commercial contracts on the basis of blockchain technology in the system of electronic transactions.

Analysis of research and problem statement. The indicator of the volume of transactions using electronic money (including cryptocurrencies) shows annual growth. In particular, the number of electronic transactions in the Eurozone will be 7 billion in 2021 (as of 2001 – less than 100 million), which indicates a growing interest in monetary transactions using electronic money [1] (Fig. 1). In addition, the number of transactions using payment cards is growing rapidly due to the gradual abandonment of the use of cash, which leads to the emergence and development of new non-cash means of payment. Accordingly, with the development of non-cash systems (especially electronic transactions), scientific research in this area is being intensified.

For example, Zhumadilova M., Dussipov Ye., Zhussupbekova M. substantiated the possibility of the emergence of electronic transactions exclusively in the field of electronic commerce [2]. improved the method of accounting for electronic settlements with budget institutions and managers of budget funds in the context of conducting tenders in electronic format [3]. Nazarova I. delineated various definitions related to electronic payments, electronic settlements with counterparties and electronic transactions from the point of view of accounting [4].

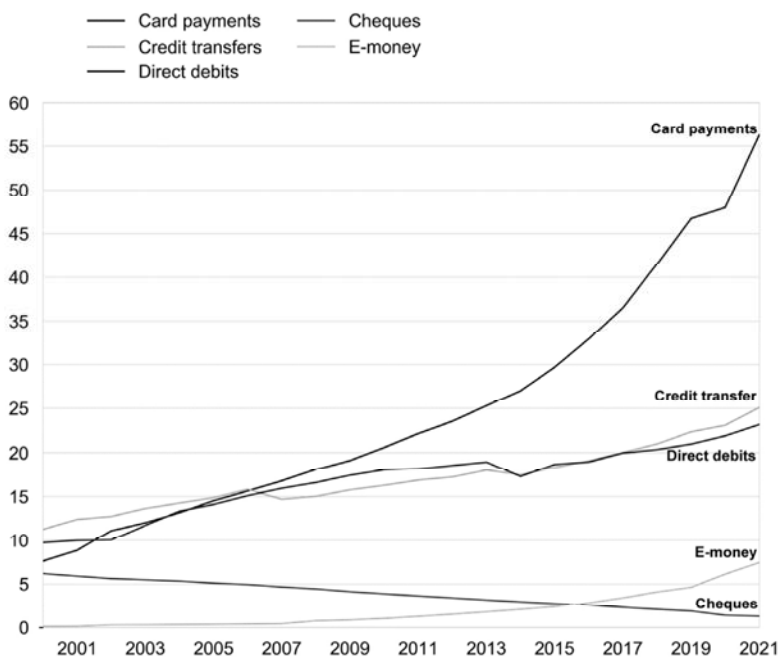


Fig. 1. The number of monetary transactions in the Eurozone in 2001-2021.
Source: European Central Bank [1].

Based on the information process of modeling the accounting of cash transactions, Yatsenko V. proposed a process approach using information and communication technologies in the study of the algorithm for the implementation of electronic transactions [5]. The research of Mints O. and Sidelov P., who improved the method of modeling the processes of electronic transactions in real time, requires the use of operational accounting information, were supplemented [6]. Chornak T. V. proves «that modern information and communication technologies ensure control of the contracted debt repayment terms in order to avoid non-compliance with the contracted conditions of cooperation» [7]. As Koblyanska O. I. explains, «non-observance of payment discipline to creditors, untimely submission of claims to debtors can lead to a decrease in the volume of highly liquid working capital, and therefore to a violation of the financial stability of the entire economic system» [8].

The need for the formation of accounting information resources for effective management of receivables and payables was studied by Tereshchenko M. K. In his opinion, «the promising direction of digitalization of electronic settlement accounting is:

- creation of an information base of payables and receivables of settlement participants;
- electronic verification of mutual requirements and obligations;
- accounting and reporting of mutual settlements;
- use of the latest information and communication technologies in accounting» [9].

Singh Harmeet and Dubey Arjun's systematization of literary sources devoted to electronic payments proves the decisive importance of blockchain technology among modern information and communication technologies in the further development of the

electronic transaction system [10]. Bellucci Marco, Cesa Bianchi Damiano and Manetti Giacomo continue their studies, which point to the need to transform accounting based on the application of blockchain technology in the process of organizing a system of electronic transactions [11]. Accounting is a generator of information necessary for effective management of electronic settlement processes with counterparties.

Barakatullah Abdul identified important structural elements of a traditional contract on the implementation of electronic transactions to establish the rights and obligations of the parties – participants in contractual relations [12]. In contrast, Wiraguna Sidi and Santiago Faisal investigated the role of electronic contracts (including smart contracts) as a legal basis for the implementation of electronic transactions between counterparties in the process of their business interaction [13]. The research was continued by Wibowo Afrizal, who proposed a mechanism for legal protection of end consumers of goods (works, services) received as a result of electronic transactions [14].

However, electronic transactions also require information protection due to their vulnerability to cyber threats. Yona O. systematized modern technologies of information protection of electronic transaction processes [15]. An important place in the cyber security of the electronic transaction system is the prevention and avoidance of the loss of confidential accounting information [16]. Positioning of accounting as a basis for ensuring cyber protection of accounting information, including in relation to electronic transactions, is submitted in other article [17].

Most scientists partially reveal the problems of organization, legal support and information protection of electronic transactions from the point of view of accounting. Despite the availability of scientific developments in the field of accounting and control of electronic transactions, the economic processes of the emergence of receivables and payables in the conditions of the use of modern information and communication technologies remain neglected, which determines the relevance of the article and its purpose.

The purpose of the article. The purpose of the scientific article is to research the prospects of the organization of accounting and control of electronic payments and the improvement of their methodology in the context of debt repayment in the conditions of the use of information and communication technologies. Achieving the established goal of scientific research involves the implementation of the following tasks: identification of organizational features of accounting and counter electronic payments based on electronic contracts in a unified system of business communications; improvement of the method of accounting and control of the occurrence and repayment of debts for electronic settlements in the conditions of the use of information and communication technologies; optimization of the procedure for calculating and accounting for the reserve of doubtful debts based on accounting information about the business reputation and solvency of counterparties;

Methods. The systematic method of research made it possible to substantiate the informational unity of electronic transaction and accounting systems. The accounting system is an information generator of data on electronic payments for managing the processes of debt origination and repayment. An innovative approach to research explains the importance of implementing innovative information and communication technologies in accounting and control processes. When considering the functions of electronic transaction systems, a functional method was used, which ensured the clarification of promising directions for

digitization of accounting and control of electronic payments with counterparties. At the final stage of the research, the method of summarizing proposals and developments was used to explain their importance and expediency in the transformation of accounting and control of socio-economic processes in the system of electronic transactions.

The methods of bibliographic and comparative analysis became the methodical tools of the conducted research. Empirical research was carried out using a bibliometric approach known as «common word analysis» and using the information resource «ResearchGate».

Research results. An important stage of the transition to electronic settlements with counterparties is the possibility of signing contractual relations using information and communication technologies. Abandoning the traditional paper conclusion of business contracts in favor of electronic documentation forms the prerequisites for a fundamental transformation in the management of electronic transactions. The food industry with trade are the leading sectors of the economy for conducting electronic transactions. All information processes of food industry enterprises can take place exclusively in electronic format via the Internet. The processes of finding counterparties of food industry enterprises, discussing the terms of cooperation, specifying the rights and obligations of cooperating parties can be carried out through electronic chat systems. Electronic tendering systems for managers of budget funds are already working effectively. On such electronic platforms, state institutions and institutions that use budget funds post commercial offers. Counterparties search and select business proposals that can be executed according to previously set conditions. Only after further consultations and staged bidding, the winner of the competition is revealed, with whom relevant contracts are concluded. According to a similar principle, it is expedient to provide for the possibility of signing contractual relations for the food industry enterprises based on the active use of information and communication technologies. The basis of such contractual relations is an electronic contract.

First of all, it is advisable to provide for the possibility of signing electronic contracts using certified electronic keys. The use of the digital signature system provides notarial confirmation and establishes legal responsibility for the fulfillment of the terms of the electronic contract. The formation of electronic contractual relationships eliminates the need for personal meetings and off-line communications of representatives of counterparties, which is relevant and important in the conditions of the COVID-19 pandemic and military operations. All business communications can take place in the context of finding counterparties and discussing the terms of electronic contracts over the Internet.

The execution of electronic contracts forms a complete array of accounting data. Accounting information from the system of electronic business communications is a valuable information resource for optimizing organizational and methodical aspects of accounting and control. Generating information about business contracts in electronic form ensures its reliability, promptness of receipt, timeliness of processing, and most importantly, creates prerequisites for automatic management of enterprise debt. Accounting information must contain all information about the terms of cooperation, the date and amount of indebtedness, its type, counterparties, repayment terms, as well as some retrospective information that does not contain commercial secrets, about previous electronic transactions of counterparties, etc.

At the time of signing contractual relationships, it is necessary to record their conditions in the accounting and control system. It is recommended to provide in the system of electronic transactions the possibility of prompt informational display of changes to already concluded business contracts and the state of their execution with the sending of information to all participants of contractual relations. On the basis of information synchronization with the operational division of the enterprise (production, provision of services, performance of works) and warehouse management, it is expedient to monitor the fulfillment of contractual obligations of food industry enterprises. Instead, the unit responsible for monetary transactions can provide information on the status of debt repayment by debtors and creditors of food industry enterprises.

The received accounting information from the system of electronic transactions, the company's own units is accumulated in the accounting unit. It is advisable to accumulate accounting information about the occurrence and repayment of debt in a distributed database based on blockchain technology (Fig. 2). Access to general data will be closed as it may contain non-disclosureable commercial information. However, this method of accumulating accounting information is a necessary element of the organization of automatic management of electronic transactions of food industry enterprises.

The accounting database of food industry enterprises based on electronic contracts on settlements with counterparties must contain a minimum list of information that forms an array of permanent (name of the counterparty, contact data, registration data, responsible persons of the organization, form of taxation, organizational and legal form, industry and sub-industry of activity), variables data (parameters of orders for goods (works, services), obligations and responsibilities according to the contract, terms of contract implementation, availability and repayment of direct taxes and fees, availability of tax invoices, payment of the order and debt repayment, method and form of payment, availability outstanding or overdue debt, the possibility of postponing payment and credit coverage) and other additional information.

Based on the comparison of accounting information about the facts of the occurrence of debt and its repayment, it is possible not only to perform automated accounting procedures, but also to control electronic settlements with counterparties of food industry enterprises. Control over the fulfillment of contractual obligations consists in the automatic monitoring of operations of the movement of material values (providing services, performance of works) with the implementation of settlement operations. First of all, it is advisable to implement the possibility of automatic reminders about approaching debt payment deadlines. Such information must be provided both to company employees responsible for electronic transactions and to official (contact) representatives of the counterparty specified in the electronic contract. Notifications may be sent automatically at reduced intervals as final payment deadlines approach.

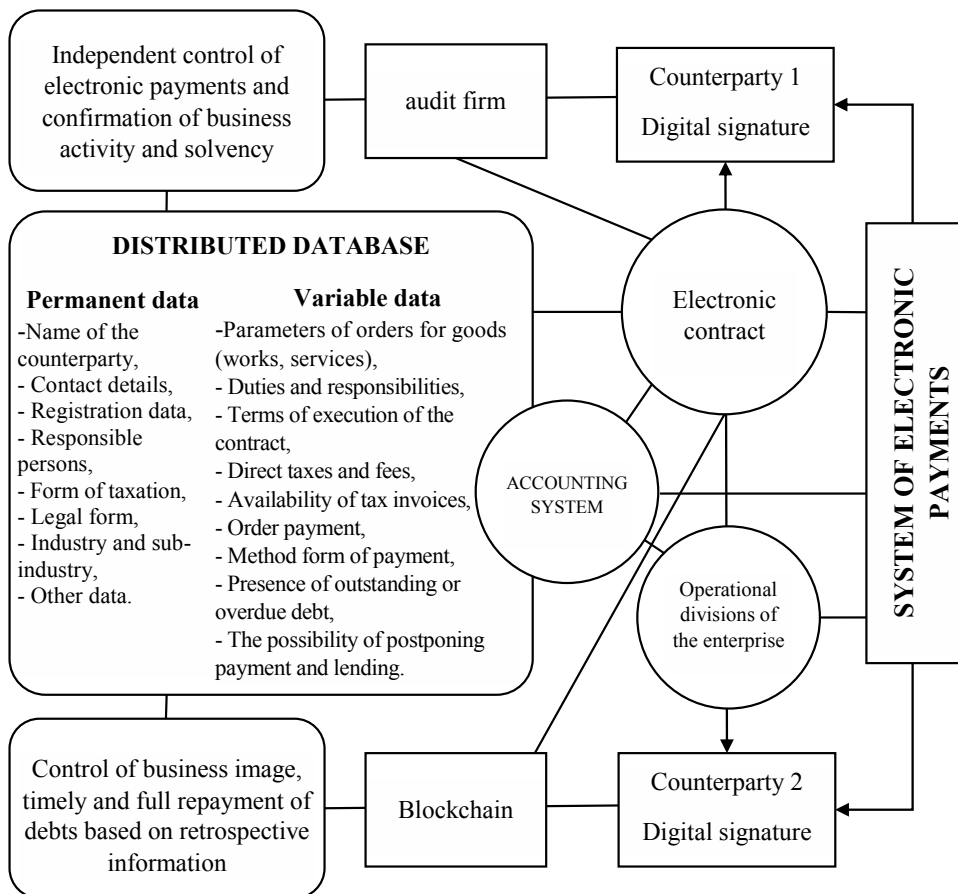


Fig. 2. Database of accounting data on electronic settlements based on electronic contracts.

Source: created by the authors.

Based on the comparison of accounting information about the facts of the occurrence of debt and its repayment, it is possible not only to perform automated accounting procedures, but also to control electronic settlements with counterparties of food industry enterprises. Control over the fulfillment of contractual obligations consists in the automatic monitoring of operations of the movement of material values (providing services, performance of works) with the implementation of settlement operations. First of all, it is advisable to implement the possibility of automatic reminders about approaching debt payment deadlines. Such information must be provided both to company employees responsible for electronic transactions and to official (contact) representatives of the counterparty specified in the electronic contract. Notifications may be sent automatically at reduced intervals as final payment deadlines approach.

On the basis of data on non-fulfillment or untimely implementation of electronic business contracts from the information environment of electronic transactions, it is advisable to analyze business activity on partner reliability of counterparties. Even at the stage of

searching for business partners, it is advisable for each counterparty to indicate its financial indicators, calculated on the basis of financial statements, and the rating of the fulfillment of previous contractual obligations for different periods of time. For all food industry enterprises, it is advisable to introduce a single multi-level gradation, in which extreme positions correspond to absolute indicators of reliability (maximum trust) and unreliability (refused to cooperate). Businesses with a negative rating may be blocked or removed from the electronic transaction system.

If the debtor has lost hope of repaying the debt, it may be automatically written off. After the absence of the last expected payment event, it is advisable to provide for the function of automatic liquidation of receivables recognized as hopeless. Information about bad debts forms relevant accounts and, most importantly, is automatically sent to a single database, which lowers the rating of business confidence and activity of the counterparty of food industry enterprises. The information scheme for rating counterparties and the formation of a reserve for doubtful debts is shown in fig. 3.

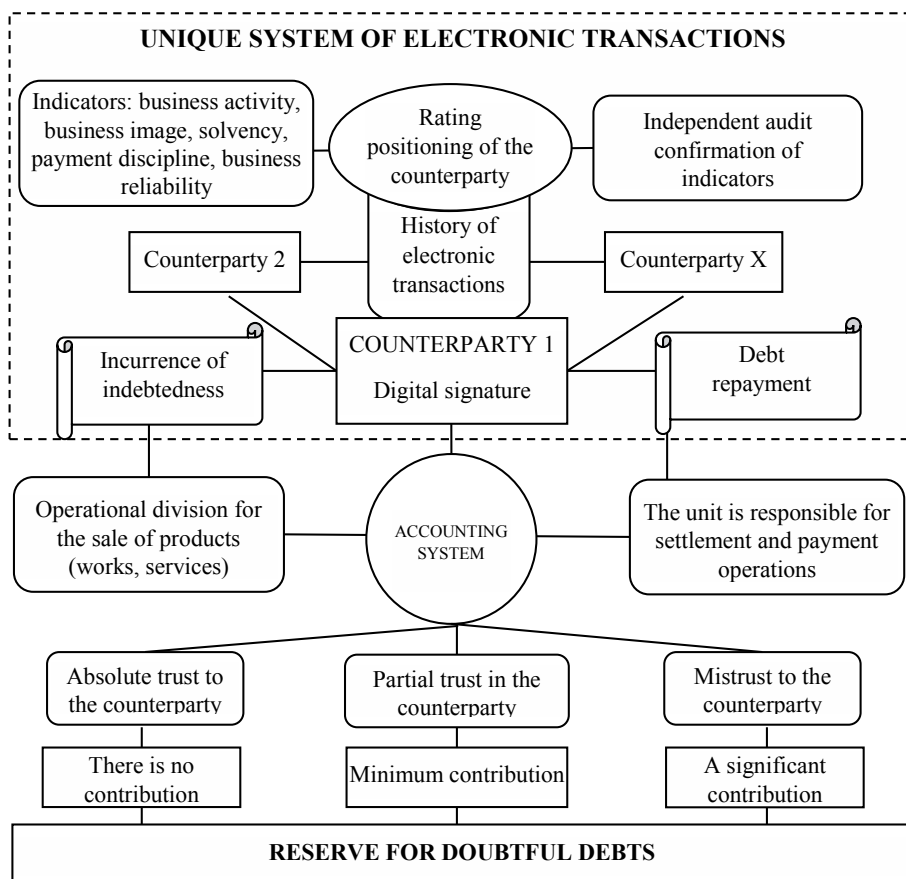


Fig. 3. Information scheme for accounting for the formation of bad debt reserves based on the rating of counterparties of food industry enterprises.

Source: created by the authors.

In order to confirm the reliability of data on the counterparty's financial condition and its payment discipline, it is advisable to involve audit control. For institutions that are of public interest, are system-forming or critically important for socio-economic formations, it is expedient to consider conducting such an audit as mandatory. The audit of electronic debt settlements can also be carried out remotely based on the processing of accounting data in electronic form. Independent auditors can confirm the reliability of accounting information, which also creates a positive business image. It is also advisable to mention the fact of periodic audits on business communication sites, which is evidence of the reliability of a potential business partner. A negative audit opinion, which is confidential, should not be displayed in the electronic transaction system and should not reduce the credit rating or business attractiveness index for other counterparties of food industry enterprises. But the absence of such a conclusion for a considerable period of time may alarm interested counterparties regarding the expediency of business cooperation.

Another important function that should be assigned to the electronic settlement management system is the automatic formation of a reserve of doubtful debts. Based on information from the electronic settlement system, formed on the principles of blockchain technology, about the payment discipline of counterparties, it is possible to automatically replenish the internal insurance fund to cover debts that are recognized as bad. In other words, the previous experience of debt repayment by the counterparty and its relationship to a certain reliability rating group makes it possible to automatically determine and reflect the amount of the reserve for doubtful debts in the accounting. The lower the counterparty's payment discipline rating, the larger the contribution to this reserve must be made. That is, the probability that the debtor will not repay the debt automatically increases the size of the reserve fund in the case of concluding an electronic contract with him. It is advisable to carry out the operations of forming a bad debt reserve automatically at the time of registration of business relations with counterparties of food industry enterprises. And after violating the terms of payment of receivables in accordance with the time parameters, it is advisable to automatically reimburse the amount of bad debts from the previously created reserve. The formation and use of such a reserve minimizes the negative impact of non-repayment of debt on the financial results of the enterprise. And after violating the terms of payment of receivables in accordance with the time parameters, it is advisable to automatically reimburse the amount of bad debts from the previously created reserve. The formation and use of such a reserve minimizes the negative impact of non-repayment of debt on the financial results of the of food industry enterpris. And after violating the terms of payment of receivables in accordance with the time parameters, it is advisable to automatically reimburse the amount of bad debts from the previously created reserve. The formation and use of such a reserve minimizes the negative impact of non-repayment of debt on the financial results of the of food industry enterpris.

Due to the information synchronization of the state of indebtedness of all counterparties of food industry enterprises within the framework of a single system of electronic settlements, it is advisable to introduce the method of mutual minimization of the company's debts based on blockchain technology. Due to the comparison of the amount of payables and receivables of counterparties, it is expedient to foresee the possibility of their offsetting. Each of the of food industry enterprise's counterparties carries out business communications with a wide

range of other companies, institutions and institutions. In the final case, the information system of electronic transactions connects all existing counterparties into a single web-like network, in which each of food industry enterpris is informationally synchronized through intermediary communications with all other business entities.

The more accounting and information systems of counterparties are integrated into a single electronic settlement environment, the higher the probability of finding common business partners. Based on the principles of operation of the blockchain technology, it is advisable to automatically alternately find the debt of third parties to joint counterparties for its minimization. After identification of such debt, it is recommended to automatically repay it by covering receivables with payables, and vice versa. It is expedient to automatically reflect the facts of mutual debt detection and repayment in accounting. In such a case, it is recommended to liquidate the accounts receivable of various debtors and, at the same time, the accounts payable to various creditors for the same amount.

Automatic offsetting of debts does not make it possible to create traditional primary documents. Therefore, information generated by an electronic settlement system based on blockchain technology can be considered as legal evidence of such an electronic transaction. In order to provide a legal basis for the mutual liquidate of receivables and payables, it is recommended to implement smart contract technology in the electronic settlement system. The execution of a smart contract involves automatic action regarding electronic transactions upon the occurrence of a certain event and compliance with the stipulated criteria. Accordingly, for the participants of the electronic settlement system, it is necessary to offer a smart contract with the option of mutual debt liquidation upon its detection and clear parameterization. That is, if there is a debt through electronic communications, the amount of which is sufficient to cover the debt of another counterparty, then it is automatically debited in turn from all participants of the contractual relationship who have approved the corresponding smart contract. The developed method of offsetting debt and its accounting in the conditions of a single information environment of electronic transactions of food industry enterprises is shown in fig. 4.

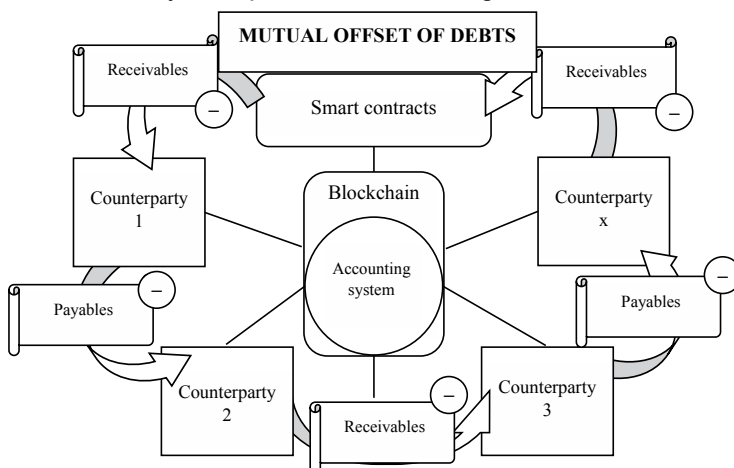


Fig. 4. Scheme of global mutual offsetting of debts between counterparties.
Source: created by the authors.

The global automatic offsetting of debts will contribute to the formation of a new unique business environment in which the aggregate debts of a certain economic ecosystem of a city, region, country or electronic environment, etc., are minimized. Thanks to the combination of blockchain information and communication technologies and smart contracts based on automatic processing of accounting information about receivables and payables, the social phenomenon of debt-free business relations with counterparties of food industry enterprises is possible. Minimization of the general level of receivables and payables is the fundamental basis of the formation of a post-industrial society and an optimization economy, in which all socio-economic processes are maximally adapted to the needs of humanity, which is the subject of further scientific research.

Conclusions. Activation of the development of information and communication technologies, such as: blockchain, cryptoassets, Internet chats, smart contracts, has led to the possibility of information integration of all counterparties interested in business cooperation into a single system of electronic transactions. It is advisable to recognize the system of electronic contracts as the basis of such an information environment of business interaction, the discussion and execution of which should be carried out remotely via the Internet. The establishment of contractual relations of food industry enterprises in electronic form creates an information basis for the digitalization of accounting for settlement with counterparties.

Information from systems of electronic contracts and electronic transactions is accumulated in a database of permanent and variable data organized using blockchain technology. In the future, it is advisable to use a single distributed database for automated accounting of food industry enterprises: the occurrence and repayment of receivables and payables; electronic settlements for debt; formation and use of the reserve of doubtful debts.

On the basis of accounting information from counterparties and the food industry enterprise's own divisions, it is recommended to carry out internal and external (auditing) control of payment discipline, timeliness and completeness of debt repayment, business activity and, in the final case, to determine and rate the counterparty's business image, according to the developed algorithm. It is advisable to indicate the rating of the counterparty's business reliability in the information system of electronic transactions when looking for business partners for cooperation, which will contribute to the prevention and avoidance of dishonest performance or non-fulfillment of obligations to the of food industry enterprise.

The final prospect of information synchronization of all counterparties of food industry enterprises with a single system of electronic transactions is expedient to recognize the possibility of automatic offset of debts. According to the developed algorithm based on the principles of blockchain technologies, it is advisable to record and control the alternate liquidating of receivables and payables of counterparties until the state of minimizing their overall level in the economy. A mandatory condition for mutual offsetting of debts is the signing of smart contracts by counterparties, which define the parameters of automatic search and liquidate of debts.

Automatic mutual offsetting of receivables and payables contributes to the formation of a unique business environment in which debts are minimized or absent. Optimizing the

overall level of indebtedness is the fundamental basis for the evolution of society and the global economy, in which all socio-economic processes will be maximally adapted to the needs of humanity, which is the subject of future scientific research and development.

References

1. Payments statistics: 2021. European Central Bank. URL: <https://www.ecb.europa.eu/press/pr/stats/paysec/html/ecb.pis2021~956efe1ee6.en.html> [in English].
2. Zhumadilova, M., Dussipov, Ye. and Zhussupbekova, M. (2020). The essence of electronic commerce and electronic transactions. Bulletin of the L.N. Gumilyov Eurasian National University. Law Series, 132, 44-56. Retrieved from: <https://doi.org/10.32523/2616-6844-2020-132-3-44-56> [in English].
3. Pochynok, N., Muravskiy, V. and Farion, V. (2021). Implementation of electronic communications in accounting of public procurement. Technology audit and production reserves, 4, 6-10. Retrieved from: <https://doi.org/10.15587/2706-5448.2021.238858> [in English].
4. Nazarova, I. (2022). Sutnist ta oblikovo-informatsiine zabezpechennia elektronnykh rozrakhunkiv [Definition, accounting and information support of electronic settlements]. Visnyk ekonomiky – Herald of Economics, 3, 123-136. Retrieved from: <https://doi.org/10.35774/visnyk2022.03.123> [in Ukrainian].
5. Yatsenko, Viktoria. (2016). Oblik operatsii z hroshovymy koshtamy ta yikh ekvivalentamy: modeliuvannia na osnovi protsesnoho pidkhodu [Accounting of cash and their equivalents: business process modeling]. Naukovo-praktychnyi zhurnal Bukhhalterskyi oblik ta audyt – Scientific and practical journal Accounting and auditing, № 7-8, 12-26 [in Ukrainian].
6. Mints, Oleksiy, Sidelov, Pavlo. (2022). Modeliuvannia hroshovykh potokiv v elektronnykh platizhnykh systemakh u rezhymi realnoho chasu [Modeling cash flows in electronic payment systems in real time]. Ekonomichnyi prostir – Economic Scope, 178, 83-88. Retrieved from: <https://doi.org/10.32782/2224-6282/178-14> [in Ukrainian].
7. Chornak, T. V. (2010). Udoskonalennia otsinky debitorskoi zaborhovanosti ta yii vidobrazhennia u zvitnosti [Improvement of the assessment of receivables and their reporting in reporting]. Naukovyi visnyk Uzhhorodskoho natsionalnoho universytetu. – Scientific herald of Uzhgorod National University, 29, 56–59 [in Ukrainian].
8. Koblianska, O. I. (2009). Metodolohichni aspekty obliku ta audytu debitorskoi zaborhovanosti [Methodological aspects of accounting and auditing of receivables]. Visnyk Kyivskoho natsionalnoho universytetu imeni Tarasa Shevchenka. – Bulletin of the Taras Shevchenko National Taras Shevchenko University, 28, 77–78 [in Ukrainian].
9. Tereshchenko, M. K. (2014). Deiaki aspekty udoskonalennia obliku, analizu ta audytu debitorskoi zaborhovanosti pidpriemstva [Some aspects of improvement of accounting, analysis and audit of accounts receivable of an enterprise]. Ekonomichnyi visnyk. – Economic Bulletin, 1, 107–113 [in Ukrainian].
10. Singh, Harmeet, Dubey, Arjun. (2021). Electronic Payments based on Blockchain Technology. A Bibliometric Review. 3rd International Conference on Advances

-
- in Computing, Communication Control and Networking (ICAC3N). 1574-1577. 10.1109/ICAC3N53548.2021.9725363 [in English].
11. Bellucci, Marco, Cesa, Bianchi Damiano and Manetti, Giacomo. (2022). Blockchain in accounting practice and research: systematic literature review. *Meditari Accountancy Research*, 30, 121-146. Retrieved from: <https://doi.org/10.1108/MEDAR-10-2021-1477> [in English].
 12. Barakatullah, Abdul. (2016). Personal Liability For Loss Of Business Of Consumer In Electronic Transaction Using The Standard Contract. *Lambung Mangkurat Law Journal*, 1. Retrieved from: <https://doi.org/10.32801/lamlaj.v1i2.14> [in English].
 13. Wiraguna, Sidi, Santiago, Faisal. (2022). The Implementation of Electronic Contract on Business to Business (B2B) Electronic Transaction. *Interdisciplinary Social Studies*, 2. Retrieved from: <https://doi.org/10.55324/iss.v2i1.304> [in English].
 14. Wibowo, Afrizal. (2022). Legal Protection for Consumers in Conducting Electronic Transactions. 1st Virtual Workshop on Writing Scientific Article for International Publication Indexed SCOPUS, pp. 7-12. Retrieved from: <https://doi.org/10.2478/9788366675827-002> [in English].
 15. Yona, Olena. (2015). Doslidzhennia stanu suchasnykh tekhnolohii zakhystu elektronnykh tranzaktsii [Research of state of modern protection technologies of electronic transactions]. *Technology audit and production reserves*, 2, 42-44. Retrieved from: <https://doi.org/10.15587/2312-8372.2015.41739> [in Ukrainian].
 16. Hassan, Md, Shukur, Zarina, Hasan, Mohammad and Al-Khaleefa, Ahmed Salih. (2020). A Review on Electronic Payments Security. *Symmetry*, 12, 13-44 [in English].
 17. Muravskiy, Volodymyr. *Accounting and Cybersecurity: Monograph*. Scientific Editor – Z.-M. Zadorozhnyi. Kindle Publishing, KDP, Seattle. USA. 2021. 200 p. [in English].

Володимир МУРАВСЬКИЙ,

доктор економічних наук, доцент,
професор кафедри обліку і оподаткування,
Західноукраїнський національний університет,
вул. Львівська, 11, м. Тернопіль, 46009, Україна,
e-mail: vvmur@gmail.com
ORCID ID: 0000-0002-6423-9059

Надія ХОМА,

кандидат фізико-математичних наук, доцент,
доцент кафедри економічної кібернетики та інформатики,
Західноукраїнський національний університет,
вул. Львівська, 11, м. Тернопіль, 46009, Україна,
e-mail: nadiiakhoma@gmail.com
ORCID ID: 0000-0003-2981-0296

Роман КАЛИН,

аспірант кафедри обліку і оподаткування,
Західноукраїнський національний університет,
вул. Львівська, 11, м. Тернопіль, 46009, Україна,

e-mail: vavanm2@gmail.com
ORCID ID: 0000-0003-2339-8122

Олег РЕВЕГА,
аспірант кафедри обліку і оподаткування,
Західноукраїнський національний університет,
вул. Львівська, 11, м. Тернопіль, 46009, Україна,
e-mail: tneubook3@gmail.com
ORCID ID: 0000-0002-6140-8726

ОБЛІК І КОНТРОЛЬ ЗАБОРГОВАНОСТІ ЗА ЕЛЕКТРОННИМИ ПЛАТЕЖАМИ ПІДПРИЄМСТВ ХАРЧОВОЇ ПРОМИСЛОВОСТІ З ВИКОРИСТАННЯМ ІНФОРМАЦІЙНО-КОМУНІКАЦІЙНИХ ТЕХНОЛОГІЙ

Анотація

Вступ. Діджиталізація соціально-економічних процесів та імплементація сучасних інформаційно-комунікаційних технологій у валютно-банківську сферу привели до еволюції методики електронних розрахунків з контрагентами. Новітнім етапом розвитку систем електронних трансакцій є інформаційна інтеграція контрагентів у єдине інформаційне середовище ділових взаємовідносин на принципах технології блокчейн.

Мета статті полягає у дослідженні особливостей організації обліку і контролю електронних розрахунків та удосконаленні їхньої методики у контексті погашення заборгованості в умовах використання інформаційно-комунікаційних технологій.

Методи. У процесі реалізації сформуваної мети наукового дослідження використано системний, інноваційний, функціональний підходи та методи узагальнення, бібліографічного та компаративного аналізу.

Результати. Доведено, що фундаментальною основою системи електронних трансакцій є електронні договори, які формують базу даних для діджиталізації обліково-контрольних процесів. Запропоновано перелік постійних та змінних облікових даних, наданих системою електронних платежів та підрозділами підприємства для діджиталізації обліку виникнення, погашення дебіторської і кредиторської заборгованості. Удосконалено порядок внутрішнього контролю платіжної дисципліни та зовнішнього незалежного контролю (підтвердження) ділової надійності, платоспроможності з інформуванням усіх зацікавлених у співпраці контрагентів. Розроблено методика рейтингування контрагентів за критерієм надійності для автоматизації обліку формування та використання резерву сумнівних боргів. Обґрунтовано можливість та доцільність почергового автоматичного взаємного заліку дебіторської та кредиторської заборгованості між усіма контрагентами підприємств харчової промисловості на основі облікової інформації за попередньо оформленими смарт-контрактами. Зроблено висновок, що взаємне погашення заборгованості в системі електронних трансакцій сприятиме мінімізації загального рівня заборгованості в економічних системах об'єднання підприємств харчової промисловості, міста, регіону тощо.

Перспективи. Автоматичний взаємозалік заборгованості забезпечує формування феномена безборгової (мінімально боргової) діяльності підприємств, що стане важливим елементом становлення постіндустріальної економіки й суспільства оптимізації, у яких усі соціально-економічні процеси адаптовані до потреб людей, що є предметом наступних наукових досліджень.

Ключові слова: облік, контроль, діджиталізація обліку, облік заборгованості, електронні трансакції, підприємства, харчова промисловість, інформаційно-комунікаційні технології.

Формули: 0, рис.: 4, табл.: 0, бібл.: 17.

Література

1. Payments statistics: 2021. European Central Bank. URL: <https://www.ecb.europa.eu/press/pr/stats/paysec/html/ecb.pis2021~956efe1ee6.en.html>.
2. Zhumadilova M., Dussipov Ye., Zhussupbekova M. The essence of electronic commerce and electronic transactions. *Bulletin of the L.N. Gumilyov Eurasian National University. Law Series*. 2020. № 132. P. 44–56. URL: <https://doi.org/10.32523/2616-6844-2020-132-3-44-56>.
3. Pochynok N., Muravskiy V., Farion V. Implementation of electronic communications in accounting of public procurement. *Technology audit and production reserves*. 2021. № 4. P. 6–10. URL: <https://doi.org/10.15587/2706-5448.2021.238858>.
4. Назарова І. Сутність та обліково-інформаційне забезпечення електронних розрахунків. *Вісник економіки*. 2022. 3. С. 123–136. URL: <https://doi.org/10.35774/visnyk2022.03.123>.
5. Яценко В. Облік операцій з грошовими коштами та їх еквівалентами: моделювання на основі процесного підходу. *Бухгалтерський облік та аудит*. 2016. № 7-8. С. 12–26. URL: <https://lib.dsau.dp.ua/book/137977>.
6. Мінц О. Ю., Сідельов П. А. Моделювання грошових потоків в електронних платіжних системах у режимі реального часу. *Економічний простір*. 2022. №178. С. 83–88. URL: <https://doi.org/10.32782/2224-6282/178-14>.
7. Чорнак Т. В. Удосконалення оцінки дебіторської заборгованості та її відображення у звітності. *Науковий вісник Ужгородського національного університету*. 2010. № 29. С. 56–59.
8. Коблянська О. І. Методологічні аспекти обліку та аудиту дебіторської заборгованості. *Вісник Київського національного університету імені Тараса Шевченка*. 2009. № 28. С. 77–78.
9. Терещенко М. К. Деякі аспекти удосконалення обліку, аналізу та аудиту дебіторської заборгованості підприємства. *Економічний вісник*. 2014. № 1. С. 107–113.
10. Singh Harmeet, Dubey Arjun. Electronic Payments based on Blockchain Technology. *A Bibliometric Review. 3rd International Conference on Advances in Computing, Communication Control and Networking (ICAC3N)*. 2021. 1574–1577. URL: <https://doi.org/10.1109/ICAC3N53548.2021.9725363>.

11. Bellucci Marco, Cesa Bianchi Damiano, Manetti Giacomo. Blockchain in accounting practice and research: systematic literature review. *Meditari Accountancy Research*. 2022. № 30. 121–146. URL: <https://doi.org/10.1108/MEDAR-10-2021-1477>.
12. Barakatullah Abdul. Personal Liability For Loss Of Business Of Consumer In Electronic Transaction Using The Standard Contract. *Lambung Mangkurat Law Journal*. 2016. № 1. URL: <https://doi.org/10.32801/lamlaj.v1i2.14>.
13. Wiraguna Sidi, Santiago Faisal. The Implementation of Electronic Contract on Business to Business (B2B) Electronic Transaction. *Interdisciplinary Social Studies*. 2022. № 2. URL: <https://doi.org/10.55324/iss.v2i1.304>.
14. Wibowo Afrizal. Legal Protection for Consumers in Conducting Electronic Transactions. *1st Virtual Workshop on Writing Scientific Article for International Publication Indexed SCOPUS*. 2022. P. 7–12. URL: <https://doi.org/10.2478/9788366675827-002>.
15. Йона О. О. Дослідження стану сучасних технологій захисту електронних транзакцій. *Technology audit and production reserves*. 2015. № 2. 42–44. URL: <https://doi.org/10.15587/2312-8372.2015.41739>.
16. Hassan Md, Shukur Zarina, Hasan Mohammad, Al-Khaleefa Ahmed Salih. A Review on Electronic Payments Security. *Symmetry*. 2020. № 12. 13–44.
17. Muravskiy Volodymyr. Accounting and Cybersecurity: Monograph. Scientific Editor – Z.-M. Zadorozhnyi. Kindle Publishing, KDP, Seattle. USA. 2021. 200 p.

Статтю отримано 31 січня 2023 р.

Article received January 31, 2023.