

BLOCKCHAIN-BASED SOLUTIONS FOR FINANCIALLY DISTRESSED OR INSOLVENT COMPANIES

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Abstract

The era of technology has been developing numerous instruments constantly, with high impact even upon areas of commercial law. One of these instruments consists of the blockchain technology, which has revolutionized traditional businesses in terms of their functioning, performance and even funding. Funding is one of the best means for companies to deal with their state of financial difficulty or insolvency, which means that the blockchain technology may be able to represent a solution for insolvency prevention or even treatment. Moreover, the blockchain technology may be helpful in other insolvency-related issues, such as debtors' stocks', assets' and contracts' management and may even substitute the traditional process of voting a restructuring plan. This paper aims to identify if and how the blockchain technology may be used as an instrument of companies' insolvency treatment and even financial difficulty prevention, given the fact that so far, it hasn't been widely used for this purpose.

Keywords: *blockchain, technology, innovation, insolvency, funding, smart contracts.*

Introduction

The blockchain technology has been increasingly used in the past decade, and its properties allowed it to be applied in a various number of fields and industries, such as banking, insurance, online storage and cloud-like services, retail, digital payments, voting processes and many others. Moreover, it may undoubtedly be applied in all business-related matters, such as the accounting industry, stocks', assets' and contracts' management, while providing a new, digital alternative for business funding. Therefore, if the blockchain technology could be applied, in theory, to all business-related matters, the following question arises: Could the blockchain technology serve its purpose in an insolvency proceeding, and, implicitly, in a restructuring process, either preventive or formal? This question is the main issue that this paper will aim to answer, providing the necessary explanations. Blockchain-based insolvency proceedings or preventive restructurings of companies may consist of a new, digital way for the participants to approach corporate liquidity issues. This paper's topic is important not only because it provides blockchain-related explanations, but particularly because it contains a fresh view of preventive and formal corporate restructuring in a digital era. Moreover, we believe that the blockchain technology will definitely be applied in pre-insolvency and insolvency proceedings at some point in the future, therefore the topic of this paper will sometime become a subject of general interest for absolutely every participant in an insolvency proceeding, commencing with the debtors, accountants, insolvency practitioners, creditors,

auditors, judges, lawyers, evaluators and so on. We also believe that the blockchain technology will not be applied in practice very soon, not only because of its temporary lack of regulation, but mainly because people, in general, who do not work in the IT industry, do not know anything about it. Applying the blockchain technology in practice will probably take place in the next decade, progressively, as traditional ways of industries' unfolding may be exceeded by future needs. As we will see in this paper, the blockchain's technology implementation in practice is, basically, inevitable, mostly because of the fact that it provides several benefits in businesses, and particularly in insolvency proceedings, one of the most important being the fact that it creates digital trust, which eliminates the need of trust between debtors and creditors in regards to a restructuring plan.

1. What is blockchain?

The blockchain technology is a digital platform which records time-stamped transactions of the digital currency called Bitcoin.¹ Bitcoin provides an alternative for online financial transactions, operated by the so-called miners, which are resolving an algorithm through cryptology and mathematics. The first miner who successfully validates the transaction is being rewarded with a small fee, in digital currency. Well-known global companies are beginning to accept digital currencies (Bitcoin and many others), such as Microsoft, CheapAir.com, Bloomberg, Expedia, KFC (Canada), McDonald's (starting in 2019), Burger King (Russia), Amazon (starting in 2019), AT&T, ASOS, Shopify and many others.² But the blockchain serves

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¹ Satoshi Nakamoto, *Bitcoin: A peer-to-peer electronic cash system*, <https://bitcoin.org/bitcoin.pdf>

² <https://coinswitch.co/news/top-25-websites-and-businesses-that-accept-bitcoins-in-2019>

much more purposes than facilitating digital currency transactions. So, what *exactly* is blockchain and what is its connection with pre-insolvency and insolvency proceedings? As its name suggests, a blockchain is basically a digital chain of blocks, the latter consisting of pieces of digital information, that are publicly stored into a chain. In other words, chained pieces of digital information create the so-called blockchain, which can be considered an electronic journal. Since it is not yet regulated, blockchain doesn't have a widely accepted definition, but if we are to provide our own definition, it would be the following: blockchain is an innovative, secure, unalterable, transparent, decentralized and distributed string of unique blocks carrying digital data, chronologically arranged, capable of storing and also creating information consisting of value, such as financial transactions and property, without the need of intermediaries' implication. For example, in a traditional online transaction between a merchant and a customer, the third party is the financial institution which needs to verify the payment. By using blockchain, the third party is eliminated out of the transaction, therefore significantly reducing costs (in this case, the banks' fee). Basically, blockchain serves as a third party, by verifying the transaction (validating the blocks that are connected in the chain) and collecting a very small fee. But still, not only the fee is significantly reduced, but also the necessary time of the payments' validation: if money is being transferred into a foreign account, this transaction could take up to several days; with blockchain, only a few seconds are necessary to confirm the payment. Furthermore, one of the main advantages of using blockchain is the digital trust it offers. When a person initiates a payment onto the blockchain, basically a new, time-stamped block is created and attached to the blockchain. The block contains all transaction-related information, except the identity of the parties, therefore protecting personal data. This protection is needed because the blockchain, or the digital journal of transactions, is public and may be stored by any computer in the world that is connected to the internet. However, even if the blockchain doesn't reveal the identity of the parties involved in a transaction, it reveals other data that could be related to a natural person's identity, therefore being in conflict with the General Data Protection Regulation.³ "This highlights that, even before the new supranational data protection framework enters into force, it is already partly outdated in respect of its application to distributed ledgers for it simply cannot account for the technology's characterizing features."⁴ If somebody tries to alter the data uploaded onto the blockchain, not only that it will be recorded, but also,

they need to simultaneously alter the entire history of chains created before the one that it is altered, since the blocks are linked to one another, across millions of computers that hold the public blockchain.⁵ This is why the blockchain is presently considered as being one of the most secure digital resources for transactions. So, what is the link between blockchain and insolvency proceedings? The fact that its properties allows it to cover most of the traditional insolvency-related issues, such as assets' tracking and evaluation, establishing directors' liability, cancelation of fraudulent acts or operations, enabling smart contracts (self-enforced contracts), elaborating a feasible restructuring plan, creditors' voting process, litigations and many other traditional insolvency-related shortcomings which may be time-consuming and also generate high costs.

2. Types of blockchain

There are mainly three types of blockchain: public blockchains, federated (consortium) blockchains and private blockchains.⁶ Public blockchains grant access to any person that wants to connect to the chain, who may generate new blocks and add them into the chain. They remain completely anonymous, and they may read all the transactions that appear on the blockchain. The consortium blockchains is a hybrid blockchain: it combines public and private blockchains and it is managed by a person or a group of persons. Access may be either public or restricted to identified parties. This type of blockchain doesn't provide complete decentralization, in opposition with public blockchains. Private blockchains are only available to identified parties and it is completely centralized. "Likely applications include database management, auditing, etc. internal to a single company, and so public readability may not be necessary in many cases at all, though in other cases public auditability is desired."⁷ In relation to the insolvency proceedings, we consider that public blockchains may not serve a common purpose with the confidentiality principles, as all restructuring-related issues would appear available to every participant in the blockchain. One might ask what the purpose of confidentiality and restricted access would be, if creditors already know the state of financial difficulty or insolvency of its debtor. The answer is that a debtor's financial state might only be temporary and publicizing it might irremediably ruin the debtor's reputation. Not every participant in the chain may have permission to add blocks (information) onto the chain, but only authorized persons. Also, restricted access to participants (creditors, debtor,

³ Published in the Official Journal of the European Union, series L 119, 4th of May 2016.

⁴ Michèle Finck, Blockchains and Data Protection in the EU, Max Planck Institute for Innovation and Competition Research Paper No. 18-01, p. 28, available for downloading https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3080322

⁵ Don Tapscott, *How the blockchain is changing money and businesses*, <https://www.youtube.com/watch?v=PI80lkkwRpc&t=2s>, min. 6:55 – 7:15.

⁶ <https://blockchainhub.net/blockchains-and-distributed-ledger-technologies-in-general/>

⁷ Vitalik Buterin, *On Public and Private Blockchains*, <https://blog.ethereum.org/2015/08/07/on-public-and-private-blockchains/>, published on the 6th of August 2015 <Accessed on the 26th of March 2019>.

insolvency practitioner, judges and other specialists) may clearly define their roles in a restructuring process, therefore preventing any sort of abuse. Therefore, it becomes clear that permissioned blockchains, the ones that offer its participants access to it, are the most suitable for the unfolding of pre-insolvency and insolvency proceedings. The Romanian Law no. 85/2014⁸ states that the ad-hoc mandate must remain completely confidential, while the preventive composition partially benefits from the principle of confidentiality. In the case of formal reorganization proceeding, as a form of the general insolvency proceeding, the principle of confidentiality isn't applied. Therefore, private blockchains may be suitable for the ad-hoc mandate, while federated (consortium) blockchains would be suitable for both the preventive composition and formal judicial reorganization. Private and consortium blockchains are both permissioned, which means that they "(...) have clearly defined governance structures compared to public blockchain networks."⁹ In relation with the Romanian Law no. 85/2014 regarding pre-insolvency and insolvency proceedings, the governance structures would be the following: in the ad-hoc mandate's case, the governance structure would be composed of the President of the Court and the ad-hoc agent appointed by the Court; in both preventive composition's and judicial reorganization's case, the governance structure would be composed of the syndic-judge and the concordat administrator, respectively the judicial administrator. Basically, governance structures represent the organs applying the proceedings, while the blockchain network's participants would be the debtors and their creditors. Moreover, the blockchain technology would be extremely useful and would facilitate cross-border insolvencies, by stimulating and speeding international cooperation between Courts and insolvency practitioners. In this specific matter, which is proactively approached¹⁰ by the European Union, the benefits of implementing the blockchain technology would mainly be cost reductions and time saving.

3. How could insolvency proceedings deploy on a blockchain?

First of all, initiating an insolvency proceeding through a blockchain would be useless if the debtor's activity wouldn't be running already on a blockchain. This premise would ease not only the detection of the debtor's state of insolvency, but it would also make it easier to set this moment in time. In traditional insolvency proceedings, establishing the exact moment when the debtor became insolvent is the main premise

of establishing directors' liability. In tradition pre-insolvency proceedings, establishing the moment in time when financial difficulties have appeared is even more complicated. These are present issues which need to be dealt with by debtors, creditors, syndic-judges and insolvency practitioners. In an ideal, digital world, businesses running on blockchain would use this technology for accounting, management, marketing and legal aspects. This means that all data recorded on the blockchain may provide evidence of financial difficulties and insolvency, while also providing the best approaching solutions.

3.1. Commencement of pre-insolvency and insolvency proceedings on blockchain

Insolvency may be installed in two ways: either gradually or suddenly. Depending on the jurisdiction in which debtors run their businesses, and mostly on the way each law defines insolvency, businesses may find themselves surpassing financial difficulties and entering directly in insolvency. Blockchain technology may be able to alert directors upon insolvency installation, so that they can take appropriate measures. The first step would be filing for insolvency to the competent Court. If all legal requirements are met, the Court may appoint an insolvency practitioner, who would enable a permissioned blockchain for the deployment of the whole insolvency proceeding. An important observation needs to be highlighted: a blockchain couldn't run insolvency proceedings automatically, because they need human intervention. Updated laws, the particularity of each pre-insolvency or insolvency case, giving participants permission to access the blockchain-based insolvency proceedings and supervision. Blockchain technologies could only be implemented to ease traditional pre-insolvency and insolvency proceedings, to reduce costs and to save time. Even the commencement of pre-insolvency and insolvency proceedings might be settled, since the blockchain's properties allows it to serve as a tool for electronic dispute resolution.¹¹ A particular case in the Romanian legal system is the fact that a financially distressed debtor needs to prove its financial difficulties, by providing the Court any document he considers to be necessary. In other words, the law doesn't specify the necessary documentation for proving financial difficulty, but however, this is the main admissibility condition that needs to be fulfilled in order to commence the ad-hoc mandate or the preventive composition proceeding. Using the blockchain technology will not only provide directors' necessary information upon financial difficulties, but it may also identify the causes. Therefore, the blockchain

⁸ Published in the Romanian Official Gazette no. 466/25.06.2014

⁹ Steven Zheng, *Crypto simplified: Explaining permissioned blockchains*, <https://www.theblockcrypto.com/2018/12/10/crypto-simplified-explaining-permissioned-blockchains/> <Accessed 26th of March 2019>

¹⁰ https://e-justice.europa.eu/content_tools_for_courts_and_practitioners-68-en.do <Accessed 26th of March 2019>

¹¹ For details, see Darcy W.E. Allen, Aaron M. Lane, Marta Poblet, *The Governance of Blockchain Dispute Resolution*, 15 February 2019 Version, available for downloading at https://www.researchgate.net/publication/331155400_The_Governance_of_Blockchain_Dispute_Resolution

technology may be implemented and used for early financial difficulty or insolvency detection, while also meeting all legal requirements for pre-insolvency and insolvency proceedings' commencement.

3.2. Assets' management in a blockchain-based pre-insolvency and insolvency proceeding

Assets' management in a traditional Romanian pre-insolvency or insolvency proceeding involve the following: identifying if any assets were sold within a period of 2 years before the commencement of the insolvency proceeding (assets' tracing), evaluation (if they are planned to be sold according to a restructuring plan) and determining if they are essential to the business' activity. Assuming a business would already run on a blockchain, before pre-insolvency or insolvency commencement, assets' management would be much easier handled by the organs applying the procedure. First of all, assets' history would be much more accessible for insolvency practitioners, since the blockchain system could reveal any information about any asset which was registered onto the blockchain. The Romanian Insolvency Law states that judicial administrators or judicial liquidators may lodge with the syndic judge petitions for cancellations of fraudulent acts or operations made by the debtor to the detriment of its creditors' rights over the past two years before the opening of the insolvency proceeding. If the syndic judge admits such a request, the asset(s) need to be reintegrated in the debtor's patrimony, in order to be exploited or sold, therefore increasing creditors' recovery rates. Such an issue is extremely time-consuming and costly in a traditional insolvency proceeding. Blockchain technology would therefore serve as a digital mechanism for dispute resolution that cancels assets' sale and returns it in the debtor's patrimony. This digital operation might save time and money. Moving forward, determining if assets are essential to business' activity is an issue that can be easily handled by insolvency practitioners. However, regarding assets' evaluation, blockchain technology would come in use. This issue is also costly and time-consuming, affecting the proceeding's effectiveness. The main problem implied by costly operations in an insolvency proceeding is the fact that they are being reflected upon creditors' recovery rates, generating tension and distrust, especially when it comes to a restructuring plan. In terms of assets' evaluation though a blockchain system, insolvency practitioners could add new blocks onto the chain, containing the following information: assets' acquisition cost, assets' amortized cost and their useful life cycle duration. Based on these economic parameters, the blockchain may easily determine and reveal assets' market price.

3.3. Participants' role in a blockchain-based pre-insolvency or insolvency proceeding

Considering that the blockchain technology is able to approach many aspects of a pre-insolvency or insolvency proceeding, one might ask what

participants' role would resume to. We will try to answer this question in the following subsections.

3.3.1. The syndic-judge's role

All pre-insolvency and insolvency Romanian proceeding have one thing in common regarding the syndic judge's role: supervision of proceedings' unfolding. In the ad-hoc mandate, the syndic-judge's attributions are the following: (i) to subpoena the debtor and the ad-hoc mandate, (ii) to verify if the debtor can be subjected to the proceeding; (iii) verifying if the debtor is able to prove its state of financial difficulty; (iv) verifying if the ad-hoc agent is an authorized insolvency practitioner; (v) designation of the ad-hoc agent and establishing its honorary. As we may see, blockchain comes in use only regarding the debtor's financial difficulty, and therefore, the syndic-judge still has legal attributions to accomplish. In both preventive composition and judicial reorganization, the syndic-judge's role is much more complex and cannot be entirely substituted by the blockchain technology. As we stated above, human intervention remains needed.

3.3.2. The debtor's role

Considering that a business would run through a permissioned blockchain system, the fact that it may reveal the installation of insolvency isn't equivalent to the proceeding's commencement. The debtor would still have the obligation to file for insolvency, since its financial state wouldn't be known by the Court. When pre-insolvency or formal insolvency proceedings are commenced, the debtors needs to respect the restructuring plan.

3.3.3. The insolvency practitioner's role

The main attribution of an insolvency practitioner remains the elaboration of a feasible restructuring plan, adapted to both debtor's and creditors' interests. Of course, the blockchain technology may be able to generate a payment graphic, but it could never have negotiations or crisis management abilities. The insolvency practitioner can negotiate with creditors and may restore trust in their debtor. As is the syndic-judge's case, the blockchain technology couldn't substitute all of insolvency practitioners' attributes, especially in relation to the current insolvency framework.

3.3.4. The creditors' role

Even in traditional pre-insolvency and insolvency proceedings, creditors' role is rather passive. They have the possibility to accept or to reject a restructuring plan, in function of their own financial state. Their main role would be voting upon essential aspects of the proceedings, when they are being summoned by the insolvency practitioner.

4. Business rescue in a digital era

Every business undergoing a restructuring process needs to benefit from its creditors' trust. Otherwise, as good as the restructuring plan would be, either extrajudicial or formal, it couldn't be implemented. If the insolvency practitioner is a good

negotiator and crisis manager, he would take into consideration the creditors' own financial state and would propose measures that benefits all parties.

4.1. Voting a restructuring plan through the blockchain

Once the insolvency practitioner grants access to all the debtor's creditors into the permissioned blockchain, they could acknowledge all pre-insolvency or insolvency related information required in order to vote a restructuring plan. In a traditional pre-insolvency or insolvency proceeding, creditors must go to the Court and request the file, so that they can see the proceeding's evolution. Through blockchain, creditors could have digital access to all permitted information. This is particularly important because trust and transparency are the main premises for a successful business restructuring. Even if traditional voting of a restructuring plan is easy to accomplish by creditors, blockchain technology would allow creditors to see each others' votes.

pre-insolvency and insolvency proceedings, in accordance with the insolvency legal framework. We therefore conclude that blockchain may be applied in practice, at its properties may be useful to detect and even prevent financial difficulties and insolvency, if the business already runs through blockchain. However, not every type of blockchain is suitable for this purpose, since only authorized persons need to create and add new blocks to the chain. If the blockchain technology is to be implemented in the following decade, in business-related fields such as accounting, this paper should serve as a starting point for further research. However, before implementing a technology with such an impact, there are many issues and shortcomings to be covered. Considering that the blockchain is both decentralized and distributed, the first step would be developing a legal framework. Another step would be to make it easy to understand by ordinary people, who do not work in the IT industry. These issues will remain to be approached progressively, and even if it seems hard to achieve, the blockchain technology will revolutionize even the pre-insolvency and insolvency field.

Conclusions

This paper has analysed the way that blockchain technology could be applied to business rescue through

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