InDret
1.2023

Blockchain as an opportunity to upgrade the right to vote in listed companies

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Abstract

Voting rights in listed companies have traditionally not reached its potential. Blockchain technology offers an opportunity to foster participation by shareholders. The purpose of this study is to analyze the suitability of blockchain for corporations as a tool to overcome the current model inconvenience. An examination of key aspects, advantages and drawbacks of blockchain technology sets the scene for intertwining with the right to vote in listed companies. Legal modifications within the European Union law context are explained to capture the intention of the EU legislature to promote shareholder engagement. Despite this new movement to engage in more transparency and participated companies, some inconsistencies are still in place. A constructive criticism to the current state of law is necessary to upgrade the corporation decision cycle by technological options to vote in listed companies.

Sumario

Los derechos de voto en las sociedades cotizadas no han alcanzado todo su potencial. La tecnología blockchain ofrece la oportunidad de fomentar la participación de los accionistas. Este estudio tiene como propósito analizar la adecuación de la tecnología blockchain para las sociedades como herramienta para superar el inconveniente modelo actual. Las ventajas y desventajas de la tecnología blockchain se examinan como aspectos clave para proyectarse en el derecho de voto en las sociedades cotizadas. Se explican los cambios jurídicos dentro de la normativa de la Unión Europea, con objeto de capturar la intención del legislador de la UE para promover la implicación de los accionistas. A pesar de este nuevo movimiento para introducir más transparencia y crear sociedades participativas, se aprecian varias incoherencias. Una crítica constructiva del estado actual de la legislación puede resultar en una mejora de la toma de decisiones corporativas, mediante la implementación de opciones tecnológicas para votar en las sociedades cotizadas.

Título: *Blockchain como oportunidad para promover los derechos de voto en las sociedades cotizadas.*

Keywords: voting right, cross-border vote, blockchain, listed companies, corporate modernization
Palabras clave: *derecho de voto, voto transfronterizo, blockchain, sociedades cotizadas, modernización de las sociedades*

DOI: 10.31009/InDret.2023.i1.03

InDret

1.2023

Recepción
29/07/2022
-
Aceptación
05/01/2023
-

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-

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1. Introduction*

A regulatory dilemma exists when new technologies are born. When is the right time to regulate them in order to provide greater security to operators? or can regulation act as an obstacle to technological innovation?[1]

When technology produces a certain risk, it is best for judges to compare costs and benefits of implementing the new technology, as they are in a better position to acquire the information they need within a litigious process. However, uncertain technologies can be dangerous if they are not foreseen as they can be used at the time of technological innovation. The legislator is best positioned to assess the degree of uncertainty that society is willing to tolerate with new technologies that are considered uncertain. Self-driving cars are an example of risky technology, while 3D printers would be an example of uncertain technology[2].

Blockchain represents an opportunity because an entire voting process in a listed company is in the hands of its shareholders. The voting process through blockchain is transparent, decentralized and in principle bottom-up. That is why it can be said that participation in a blockchain-enabled e-voting system reinforces primacy of shareholders.

Voting in listed companies has traditionally not reached its potential. Blockchain technology offers a timeliness to foster shareholders' participation. Nevertheless, blockchain protocol is quite complicated, which can present itself as a barrier for the public to accept, recognize, trust, and finally use it for voting. Moreover, designed policies of the blockchain network reflect the values of computer scientists who design the code, no matter how much it is stressed that it is a neutral technology.

The purpose of this study is to analyze the suitability of blockchain for corporations as a tool to overcome the current model inconvenience for shareholders rights, in particular the right to vote. An examination of key aspects, advantages and drawbacks of blockchain technology sets the scene for intertwining with the exercise of voting rights in listed companies (section 2). In this section, Delaware law is described as it may be an example of a flexible model in relation to blockchain introduction in corporate law. Afterwards, shareholder passivity is explained focusing on complexity of the current securities holding system (section 3). Legal modifications within the EU law context are explained to capture the EU legislative intention to promote shareholder engagement. The transition between the Directive 2007/36 on the exercise to

* ORCID 0000-0003-0862-8188. This work has been carried out within the framework of the national research project «Gobierno Corporativo: Desafíos Regulatorios ante la Digitalización del Derecho de Sociedades» (PID2019-104019RB-I00), funded by the Ministry of Science and Innovation. A part of this work was presented in the International Conference *Temi attuali di Governo dei Gruppi Societari* at Lluis University held in Rome during 30, 31 March and 1 April 2022.

[1] In Spanish literature, NAVARRO LÉRIDA, María del Sagrario, «El poder de decisión societario y blockchain», en MUÑOZ PÉREZ, Ana Felicitas (Dir.), *Revolución digital, Derecho mercantil y token economía*, Tecnos, Madrid, 2019, pp. 287-303, pp. 287-288.

[2] KOLACZ, Marta, QUINTAVALLA, Alberto, YALNAZOV, Orlin. «Who Should Regulate Disruptive Technology», *European Journal of Risk Regulation*, 10(1), 2019, pp. 4-22. These authors distinguish between a risky technology and an uncertain technology.

shareholder rights in listed companies (Shareholder Rights Directive I)[3] and Directive 2017/828 on long-term shareholder engagement (Shareholder Rights Directive II)[4] is evaluated. Despite this new movement to engage in more transparency and participated companies, some inconsistencies are still in place. A constructive criticism to the current state of law can be solved by technological options to vote in listed companies as an opportunity to upgrade the corporation decision cycle as convenience. Technological options to incorporate voting via blockchain are examined in the following section (section 4). Next, the analysis mentions economic interests to regulate, pandemic effects and the power of intermediaries in capital markets as they are factors to consider in order to understand the current situation (section 5). Some conclusions are reached on the positive effects that blockchain can bring to a corporation decision making process (section 6).

2. Blockchain Technology

2.1. Advantages of Blockchain Technology

Blockchain is a way to communicate and store information in a system without the need for an intermediary. It is considered a new global resource. A blockchain is a network of nodes, where nodes are responsible for acting as a communication point that can carry out different functions. Nodes in the network can communicate directly with each other. In general, a node is a point where it is possible to receive, send, or create a message.[5]

Instead of storing data individually, data is encrypted and collected in a block using cryptographic techniques. There are two types of keys that are used to encrypt or decrypt data depending on the sender and receiver of the information. The message is encrypted with a private key known only to the sender and the receiver can decrypt it using a public key provided by the sender. A ledger is a "place" to record all transactions that occur in the system. It is similar to a ledger or record of transactions carried out, which acts like a database with the information organized in a certain way.

Most significant properties of blockchain technology are immutability, security and transparency.

a. Immutability

Immutability is considered essential to data integrity. Users are allowed to enter new transactions but not to modify or delete what has been entered. Information is collected in blocks. Each block is linked to the previous block and is checked with a timestamp. Blocks are encrypted separately and stored in chronological order, creating a chain. In addition, it is possible to get a succinct cryptographic summary, which is a short string that avoids storing the

[3] Directive 2007/36/EC of the European Parliament and of the Council of 11 July 2007 on the exercise of certain rights of shareholders in listed companies, OJ L 184, 14.7.2007.

[4] Directive (EU) 2017/828 of 17 May 2017 amending Directive 2007/36/EC as regards the promotion of long-term shareholder engagement, OJ L 132/1, 20.5.2017.

[5] EU Union Blockchain Observatory And Forum, *Blockchain and the GDPR*, 33 (16 Oct. 2018), https://www.eublockchainforum.eu/sites/default/files/reports/20181016_report_gdpr.pdf?width=1024&height=800&iframe=true

entire ledger. Consequently, any manipulation of the ledger would be reflected in the cryptographic summary[6].

b. Security

Making a secure transaction without intermediaries requires a secure system or protocol for transferring assets, as well as protection against transferring assets twice (double spending problem) and an immutable record of asset ownership that can be updated automatically and securely, the ledger.

Information is stored collectively in a peer-to-peer network, so the communication infrastructure is distributed and not centralized. All nodes are connected creating a global data structure. There are two types of nodes depending on the role they play: participating nodes and validating nodes. While participating nodes store synchronized copies of data, validation nodes can add data to the ledger, according to a consensus mechanism based on an agreed algorithm. Validation nodes have computational power and software to validate transactions[7].

In addition, participating nodes can be full nodes or light nodes, depending on the amount of data stored by them. The nodes that store a copy of all the data are full nodes, which ensures the security and correctness of the data. In contrast, a lightweight node appears when a user is connected to a participating node; but to add data, you need to connect to a full node that synchronizes with the current state of the network. Therefore, lightweight nodes do not require as many resources at the expense of security[8]. Distributed ledger allows for greater security than central systems of record, because peer-to-peer networking and distributed data storage provide multiple copies of a single ledger between participants in the system, so that all participants have a shared history of all transactions in the system.

c. Transparency

Blockchain technologies can be classified according to how information is accessed and how information is added and validated. Blockchains can be public or private and require authorization or not require authorization.

A public blockchain means that everyone can access the network, as opposed to a private blockchain where only a certain set of individuals have access to the network[9]. Parties on a

[6] FENTON, Bruce, «It is Better to Lose Your Investment Than Lose Your Blockchain», *Medium* (17 June 2016), https://medium.com/@brucefenton/its-better-to-lose-your-investment-than-lose-your-blockchain-2907a59d5a40 («The strength of blockchain tech is that it is a ledger, a statement of truth. That ledger is only as good as its resistance to censorship, change, demands or attack»)

[7] ZETZSCHE, Dirk A. *et al*., «The Distributed Liability of Distributed Ledgers: Legal Risks of Blockchain», *University of Illinois Law Review*, vol. 2018, No. 4, pp. 1361-1407, p. 1371 (2018).

[8] EVANS, John, *Blockchain Nodes: An In-Depth Guide*, NODES.COM, https://nodes.com (last consultation 26/03/2022).

[9] LEWIS Rebecca, *et al*., *Blockchain and Financial Market Innovation*, FED. RES. BANK OF CHICAGO (2017), https://www.chicagofed.org/publications/economic-perspectives/2017/7.

private blockchain are often members of a group or will have to be authorized.[10] Transparency is a trait of blockchain but in a private blockchain only authorised members have full transparency which contrasts with public blockchains.

Another consequence of creating a public network as opposed to a private network is the need for an economic incentive for operation of the blockchain. While in a public network economic incentives will be necessary for the blockchain to work, it is not necessary to build the blockchain in exchange for a price represented by tokens in a private network. That is, mining is not necessary, since the contract that configures the private blockchain can define the protection measures of the network and its nodes.[11]

Depending on who can add information to the network, blockchains can be structured allowing anyone to publish on the network, it is "permissionless"[12], nobody needs authorization. The most well-known blockchains without need for authorization from anyone are Bitcoin and Ethereum. In contrast, a "permissioned" blockchain only allows an individual to add information to the network if they have prior authorization[13]. Examples of "permissioned" blockchain are Hyperledger, R3CEV[14] and Corda.

Under public and permissionless blockchain applications, all parties can download the open software and participate in the network, without asking for prior permission and without the need to reveal their identity. Therefore, from the point of view of data protection, creation of a public and permissionless blockchain is not indifferent. For example, all data is on the Bitcoin blockchain, except for owners' identities[15]. Content of a document is simplified into a hash through a hash function. The result of the hash function is a string of digits to the input data called hash value[16]. The block header is composed of the hash of the previous block, the timestamp, and other metadata information[17]. This information is public and creates an automatic proof of position and ownership of each block in the chain[18]. In principle, the private key is necessary, it is not stored in the ledger but in the owner's wallet.

However, anyone can see who owns each block because of the block heading, so it is possible to loop through the chain by following the links. Therefore, to protect privacy of shareholders

[10] JOSHI, Archana Prashanth, *et al.*, «A survey on security and privacy issues of blockchain technology», *Mathematical Found. Of Computing*, Vol. 1. No. 2, pp. 121-147, §§ 2.2, 2.4 (May 2018), https://www.aimsciences.org/article/doi/10.3934/mfc.2018007

[11] IBAÑEZ JIMÉNEZ, Javier Wenceslao, *Derecho de Blockchain y de la tecnología de registros distribuidos*, Aranzadi, Navarra, 2018, p. 56.

[12] *Blockchain and the GDPR*, European Union Blockchain Observatory and Forum, (16/10/2018), p. 14, https://www.eublockchainforum.eu/sites/default/files/reports/20181016_report_gdpr.pdf?width=1024&height=800&iframe=true

[13] *Ibid*, p. 15.

[14] YERMACK, David, «Corporate Governance and Blockchains», *Review of Finance*, Vol. 21. No.1, 2017, pp. 7-31, p. 16.

[15] DE FILIPPI, Primavera, WRIGHT, Aaron, *Blockchain and the Law: The Rule of Code,* Harvard University Press, 2018, p. 68.

[16] BACON Jean *et al.*, «Blockchain Demystified: A Technical and Legal Introduction to Distributed and Centralized Ledgers», *Richmond Journal of Law and Technology*, Vol. XXV, No. 1, 2018, pp. 1-106, p. 9.

[17] *Ibid.*, pp.12-13. See JOSHI et al., *op.cit.*, § 2.3.

[18] UMEH, Jude, «Blockchain Double Bubble or Double Trouble?», 58 *ITNOW,* 2016, p. 59.

would be to use a different digital wallet for every transaction[19] or even that code structures every transaction in different wallets at once[20].

With public and permissioned blockchain applications, anyone can gain access to the network, but authorization is needed to be able to add information. The Alastria Project in Spain is an example of this type of network.[21] It is the first multisectoral consortium promoted by companies and institutions for the establishment of a blockchain with semi-public infrastructure, without embedded cryptocurrency. The aforementioned project effectively supports services in Spain and in accordance with the European Data Protection Regulation. Repsol, Bankia, Cepsa, MAPFRE, Banco Sabadell, Ferrovial and Grupo Red Eléctrica are partners for a project on verification of supplier documentation and access xontrol (DIGITALIS)[22]. It seeks to create a unique digital identity for supplier companies[23]. Another project (DALION) consists of allowing people to have their personal data in a single digital identity, backed by collaborating entities and stored in their own wallet of identity. The participating companies are Santander, Bankia, CaixaBank, Naturgy and Repsol[24]. Some cities and regions are using blockchain to facilitate administrative procedures. At the local level, we can mention Alcobendas in Madrid and at the regional level, Junta de Galicia.

Private and permissioned blockchains are suitable for businesses in highly regulated industries, such as banking and financial institutions. In a permissioned blockchain applications, an authority or consortium decides who can participate in recording information in the shared database[25]. Therefore, assignment of responsibilities may be easier, because the consortium or central authority ultimately retains control and sets limits on who can access. For example, the Ripple protocol, which is used by banks, is based on a network of selected participants that validates transaction records[26]. Pilot tests that have been developed in practice for voting at the General Shareholders' Meeting and for the clearing and settlement of securities use private blockchains as well[27].

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[19] Just as there are single-use virtual debit jacks.

[20] JIMÉNEZ-GÓMEZ, Briseida Sofía, «Risks of Blockchain for Data Protection: A European Approach», *Santa Clara High Technology Law Journal,* vol. 36, No. 3, 2020, pp. 281-342, pp. 333-338.

[21] Alastria: Association of Decentralized Technologies/Blockchain (2020), https://www.alastria.io/ The first of today's networks of partner nodes Alastria (Red-T) is built on Quorum technology. The second of the networks (B-Net) is built on Hyperledger Besu. The partners of Alastria herself have defined how a platform blockchain agnostic, so they do not entrust development to a single platform. They created yet another type of network based on HyperLedger Fabric (from The Linux Foundation) and try to interconnect the three networks and with other networks in the future.

[22] https://prensa.bancsabadell.com/es/Noticias/2019/06/digitalis-primera-plataforma-blockchain-para-la-creacion-y-validacion-distribuida--de-identidad-digital-de-proveedores

[23] Each certificate and document reviewed by its client companies will be validated and registered in a univocal and immutable way on its digital identity, being able to be reused in any subsequent contracting process with the same or with other client companies, without the need to repeat the transaction.

[24] «Santander, Bankia, CaixaBank, Naturgy y Repsol impulsan un modelo de identidad digital autogestionada», *Cinco Días*, 5/11/2020, han hecho sobre una de las infraestructuras *blockchain* (Ethereum-Quorum) del consorcio Alastria https://cincodias.elpais.com/cincodias/2020/11/05/companias/1604592642_776772.html

[25] LEWIS *op.cit.*

[26] BUTERIN, Vitalik, «Introducing Ripple: A Detailed Look at Cryptocurrency's New Kid on the Block», Bitcoin Magazine (26/02/2013), https://bitcoinmagazine.com/articles/introducingripple.

[27] YERMACK, *op.cit.*, p. 9. VAN DER ELST, Christoph, LAFARRE, Anne, «Blockchain and Smart Contracting for the Shareholder Community», *European Business Organization Law Review*, 2019, No. 20, pp. 111-137, pp. 130-131.

Private and permissioned blockchain applications tend to be faster than public ones, as the consensus mechanism is not based on "Proof of Work," but on "Proof of Stake," and the pool of participants may be smaller than on blockchains that do not require permission[28]. The distinction between "Proof of Work" and "Proof of Stake" comes from how transactions are validated[29]. A miner is a node that calculates hash values. Each node in the network calculates the hash value in "Proof of Work" (PoW[30]). Miners add a random number, called a nonce, to the block header to create a valid block[31]. In contrast, a "Proof of Stake" (PoS) protocol involves miners being able to mine or validate transactions in a block depending on how much cryptocurrency the user owns[32]. Validators are the nodes that mine, but the decision on which node to validate a block, although done randomly, gives greater probability to those who meet a series of criteria, in particular the amount of currency reserved and time of participation in the network. PoS can save electricity costs and enable faster blockchains, bringing better security and scalability to the networks that deploy it[33]. In addition, miners in PoS earn a transaction fee based on their contribution to the network by freezing their coins as a deposit. Therefore, the reward is a transaction fee proportional to the amount they have invested[34].

2.2. Disadvantages of Blockchain Technology

Some disadvantages of blockchain technology should also be mentioned. Cost, decentralization, transparency, data protection and cybersecurity can pose a challenge.

a. Cost

A corporation faces the cost of creating a blockchain system specifically to reflect the characteristics of choice within the listed company, or the opportunity to use a known blockchain network as a base. This second alternative is known as "piggyback" because it is based on an already established network which in principle should save costs and be easier. The Ethereum network could be used, for example.

Very different opinions have been expressed about the cost of establishing a blockchain in the stock markets. We can cite the opinion of the president of the German Central Bank in 2019, who rejected the use of blockchain technology to transfer and offset values following the pilot project carried out that resulted in it being slower and more expensive than currently employed

GALLEGO CÓRCOLES, Ascensión, «El Blockchain en la Junta General», en MUÑOZ PÉREZ, Ana Felicitas (Dir.), *Revolución digital, Derecho mercantil y token economía*, Tecnos, Madrid, 2019, pp. 306-339. NAVARRO LÉRIDA, María del Sagrario, «El poder de decisión societario y blockchain», en MUÑOZ PÉREZ, Ana Felicitas (Dir.), *Revolución digital, Derecho mercantil y token economía*, Tecnos, Madrid, 2019, pp. 287-303.

[28] SHARMA, Toshendra K., «Advantages and disadvantages of permissionless blockchain», *Blockchain Council* (Oct. 3, 2018), https://www.blockchaincouncil.org/blockchain/advantages-and-disadvantages-of-permissionless-blockchain/.

[29] *Proof of Work vs Proof of Stake*, BITDEGREE (Last Updated: November 27, 2021), https://www.bitdegree.org/tutorials/proof-of-work-vs-proof-of-stake/.

[30] Ibid.

[31] BACON *op.cit*., p. 24

[32] JOSHI, *op.cit.*, §2.4.

[33] BUTERIN, VITALIK, *On Stake*, Ethereum Blog (05/07/2014), https://blog.ethereum.org/2014/07/05/stake/

[34] *Vid.*, Proof of Work vs Proof of Stake, BITDEGREE, *op.cit*.

methods[35]. However, the European Central Bank published a report in 2021 on the use of distributed ledger technology for market post-contracting processes, concluding that applying DLT to these processes could result in cost savings and efficiency gains[36]. Rather what is feared is that implementation of blockchain technology will result in a delay in achieving capital market integration. Indeed, European doctrine has already warned of the risks of blockchain legislation that can create a world similar to those of intermediated securities holding where several laws have to be consulted to determine rights of investors[37]. Any uncoordinated national initiative in the European market can pose a threat to the EU's monetary and financial Union.[38] In addition, with respect to cost as any investment if applied to the stock market, costs will be saved in the long term.[39]

b. Decentralization

Regarding the characteristic of decentralization, the example of DEFI or decentralized finance has been criticized because it would produce an "illusion" as the need for governance makes inevitable a certain level of centralization and structural aspects of the system lead to a concentration of power[40]. Current vulnerabilities could lead to undermining financial stability if expansion of the system were to become widespread. However, it is noteworthy that DEFIs are developed through "permissioned blockchains".

Therefore, although the core of blockchain technology is to be conceived as a tool that allows decentralizing things that we always thought needed centralization, the mere invention of this technology is not enough to ensure that it is used or used in the way it was intended, because it will only be decentralized to the extent that people decide to use it that way. [41]

c. Transparency

[35] PARSONS, Joe, «German Central Bank: Blockchain slower and expensive to implement», (31/05/2019) https://www.thetradenews.com/german-central-bank-blockchain-slower-expensive-implement/.

[36] EUROPEAN CENTRAL BANK, *The use of DLT in post-trade processes*, (Aspectacles 2021), p. 2 https://www.ecb.europa.eu/pub/pdf/other/ecb.20210412_useofdltposttradeprocesses~958e3af1c8.en.pdf

[37] LEHMANN, Matthias, « National Blockchain Laws as a Threat to Capital Markets Integration», *Uniform Law Review*, Vol. 26, No. 1, 2021, pp. 148-179.

[38] Regulation (UE) 2022/858 of the European Parliament and of the Council of 30 May 2022, on a pilot regime for market infrastructures based on distributed ledger technology, and amending Regulations (EU) No 600/2014 and (EU) No. 600/2014 and (EU) No 909/2014 and Directive 2014/65/EU, OJ L 151/1, 2.6.2022.

[39] STRASSMAN, Ryan, «XII. Delaware Explicitly Legalizes Corporate Documentation Road Blockchain», D*evelopments in Banking and Financial Law*, 2017, pp. 166 ss, pp. 170-171: Currently, the fees associated with the settlement and clearing of post-transaction operations are estimated at approximately $100 billion. Technology Blockchain it has the potential to completely eliminate intermediaries who charge transaction fees. These nodes are dedicated to confirming the validity of the command. This self-verification process removes for-profit intermediaries from transactions. This cost-cutting capability is a primary goal of those currently exploring the implementation of blockchain. The potential annual cost savings from such an implementation could reach $10 billion for each of the world's largest investment banks.

[40] MUÑOZ PÉREZ, Ana Felicitas, «Aspectos sobre las finanzas descentralizadas DEFI, protocolo de préstamos», *Revista de Derecho de Mercado de Valores*, No. 29, 2021.

[41] MAGNUSON, William, *Blockchain Democracy*, Cambridge, Cambridge University Press, 2020, p. 67.

System transparency is a point of concern because transaction data is not only available to participants in the network, but also, according to BlockExplorer, to anyone else[42]. Therefore, quid pro quo exists, as a more transparent network undermines privacy. On the other hand, a permissioned blockchain is inherently private because a participant needs acceptance from the administrator to join the network. The administrator role is like a guardian. In these systems, not everyone can see transaction data. Only participants who belong to the network. From a privacy standpoint, tweaking a permissioned blockchain can be a solution to comply with most data protection regulations. In fact, private and permissioned blockchains are generally designed for a specific purpose, in contrast to public blockchains that tend to realize an overall goal. In this sense, it will be the issuing company that structures the voting procedure if it considers that in addition to being private, the blockchain network should be permissioned, so that only certain people can validate transactions and shareholders enjoy anonymity[43]. In case of a takeover bid, it may be more interesting to establish a public blockchain to avoid hostile positions.[44]

d. Data protection

One of the challenges facing such disruptive technology is compliance with the European Data Protection Regulation and national privacy laws while registering votes in a blockchain system[45]. However, it is technically possible for blockchain technology to adapt to data protection regulation and thus, to meet the objective of having an efficient voting system in listed companies, being more transparent for investors[46].

e. Cybersecurity

Finally, cybersecurity is one of the most worrying drawbacks. Not exclusively referred to a vote in a shareholders' meeting, a voting system on the blockchain due to its consensus technological properties presents some concerns when fraud arises. For example, when a hole in security is discovered within the code, it cannot be corrected until all users vote[47].

Permissioned blockchains can be more vulnerable, as the network is based on selected parts that could be a target for hackers or the parties could agree to manipulate the blockchain[48]. Perhaps the fact that there is an entity (a third party) that controls most nodes in the vote at the General Shareholders' Meeting and that can both confirm transactions and register them in the registry detracts from part of its attractiveness to the blockchain, since it becomes a simple database. So

[42] BLOCKEXPLORER, https://blockexplorer.com (accessed 25/03/ 2022).

[43] YERMACK, *op.cit.*, p.17.

[44] *Ibid.*, p. 18.

[45] In the case of Spain, Organic Law 3/2018, of December 5, on the Protection of Personal Data and guarantee of digital rights, BOE No. 294, of December 6, 2018.

[46] *See* JIMÉNEZ-GÓMEZ, B.S., *op.cit*.

[47] HACKL, Cathy, «What Are DAOs And Why You Should Pay Attention», *Forbes*, (June 1, 2021,08:00am EDT), https://www.forbes.com/sites/cathyhackl/2021/06/01/what-are-daos-and-why-you-should-pay-attention/ (accessed 25/03/2022)

[48] DE FILIPPI, WRIGHT, *op.cit.*, p. 30.

private blockchains are not so revolutionary from the organizational point of view, although they represent a technical novelty.

At that point, the odds of hackers committing fraud by taking advantage of the code flaw increase with the creation of a DAO (Decentralized Autonomous Organization). A DAO is defined as an organization represented by rules codified thanks to a transparent computer program, controlled by the organization´s members and not influenced by a central power. The organization exists on the blockchain because rules are built into the code, which means that no administrators are needed. One example is the Voatz blockchain application for voting in U.S. elections, in which MIT researchers found cybersecurity flaws in 2020.[49] However, the U.S. Cybersecurity and Infrastructure Agency (CISA) concluded that there had been no active threats during the period it was operating.[50]

2.3. Interaction between blockchain and cross-border voting

a. The Spanish market

Promoting cross-border voting comes from the current data on foreign investors of listed companies on the Spanish Stock Exchange. According to a 2017 report by Bolsas y Mercados Españoles, 46% of the total market capitalization is in the hands of foreign investors[51]. This figure increases to more than 57% in 2021.[52] Cross-border voting is defined as the one that would correspond to exercise to a non-resident shareholder who are not legitimized as a shareholder in accordance with the national law of the company issuing the shares, however, the foreign shareholder appears as a beneficiary of the rights derived from the shares in the foreign records of the last intermediary in the custody chain of shares[53].

According to Broadbridge, implementing blockchain technology implies global transparency of proxy holders. It is understood that such increased transparency implies improvements in operational efficiency, safety and analytics. Such improvements would be good for investors, agent banks, custodians and securities issuers.[54] Santander Inversiones with more than four

[49] NELSON, Danny, «Overstock Touts Voatz Blockchain Voting App as Solution to US Election Fracas», *Coindesk*, Oct 30, 2020 at 7:09 p.m. Updated Sep 14, 2021 at 12:25 p.m.https://www.coindesk.com/markets/2020/10/30/overstock-touts-voatz-blockchain-voting-app-as-solution-to-us-election-fracas/

[50] *Ibid.*

[51] Bolsas y Mercados Españoles, *Annual Report on the Ownership of Listed Shares*, 2017, entitled «Half of the Spanish Stock Exchange, in the hands of foreign investors», available in www.bolsasymercados.es «La mitad de la Bolsa española, en manos de inversores extranjeros»

[52] «Los inversores extranjeros ya tienen más del 57% del Ibex 35 en su poder» (24/05/2021), *El economista*, https://www.eleconomista.es/mercados-cotizaciones/noticias/11233071/05/21/Los-inversores-extranjeros-ya-tiene-mas-del-57-del-Ibex-35-en-su-poder.html

[53] For a study that follows this definition, see HERNÁNDEZ PEÑASCO, Ramón, «El voto transfronterizo mediante intermediario financiero: el artículo 524 de la ley de sociedades de capital», *Revista de Derecho de Sociedades,* nº 40, 2013, section Introduction, (Thomson Reuters online)

[54] See https://www.broadridge.com/press-release/2018/santander-and-broadridge-completed-practical-use-of-blockchain

million shareholders and 60.7% of the capital in the hands of institutional investors has carried out a pilot project for voting at the General Shareholders' Meeting through blockchain[55]. According to the company's website, at the Meeting on March 23, 2018, shareholders were able to see how their votes could be counted and confirmed "more quickly" thanks to blockchain technology, instead of having to wait two weeks in a process that includes manual activity of different intermediaries. Therefore, they confirm that accounting and confirmation of the vote will be possible to do so instantaneously. In addition, reference is made to the fact that voting via blockchain could help motivate shareholders to vote. At the 2018 Santander General Shareholders Meeting, a quorum of 64.55% of shareholders was reached.

The most recent Spanish example of using blockchain was done by Iberdrola on June 17, 2022[56]. Blockchain was used to certify shareholder participation in the GSM. Iberdrola became the first Ibex 35 company to implement this technology for all investors. According to Iberdrola, «shareholders may make the consultation from the time their participation is registered until one month after the holding of the General Shareholders' Meeting». Moreover, blockchain certified the proxies and votes of shareholders who went to the service points that were opened in Madrid, Barcelona, Bilbao, Santander, Valladolid, San Sebastián, Zaragoza and Valencia. Blockchain implementation is one of the main ways to encourage Iberdrola shareholders to vote[57].

b. The Delaware effect

The «Delaware effect» is well known in U.S. corporate law. Companies are incorporated in a small State by the quality of its corporate law without having such a State the economic importance that one would expect.[58] That is, the content of corporate law is not trivial, but a very relevant factor when choosing where a company is created. The lex societatis regulates issuance of securities by a company, even if the share listing regime is within the scope of the capital market law where the company's securities are traded. The lex societatis also regulates the members' rights, including the right of legitimacy to vote, as well as the entire structure and functioning of the corporate bodies, both the Shareholders' Meeting and the Board of Directors.

Delaware's blockchain initiative crystallized since August 1, 2017 in the amendment of the Delaware Companies Law to explicitly allow the use of blockchain to register and trade shares[59]. Sections 219(c) and 224 of Title 8 of the Delaware Code are relevant. Section 219(c) Title 8 of the Delaware Code defines the stock ledger as records maintained by a corporation detailing its

[55] Some investors like banks, investment fund and pension fund managers and insurance companies are called institutional investors because are supposed to have greater qualifications, knowledge and experience, so the degree of protection offered by the regulations is lower than that of retail (private) investors.

[56] «Iberdrola the first company to use blockchain to certify shareholdings in the General Shareholders' Meeting», News, 22/05/2022, accessed at https://www.iberdrola.com/press-room/news/detail/iberdrola-first-company-to-use-blockchain-to-certify-shareholdings-general-shareholders-meeting

[57] The other way is granting a reward per participation.

[58] ARENAS GARCÍA, Rafael, «Sociedades» in FERNÁNDEZ ROZAS, José Carlos, ARENAS GARCÍA, Rafael, DE MIGUEL ASENSIO, Pedro Alberto, *Derecho de los Negocios Internacionales,* 5th ed., Madrid, Iustel, 2016, p. 197.

[59] ROBERTS, Jeff John, *Companies Can Put Shareholders on a Blockchain Starting Today*, FORTUNE (Aug. 1, 2017), http://fortune.com/2017/08/01/blockchain-shareholders-law/ [http://perma.cc/66YG-GUTA] For example, *see* METZ, Cade, *Overstock Begins Trading Its Shares Via the Bitcoin Blockchain*, WIRED (15/12/2016, 6:20 PM), https://www.wired.com/2016/12/overstock-com-issues-stock-via-bitcoin-blockchain/ [http://perma.cc/85HM-LXGM].

shareholder record and all issuances and transfers of its shares in accordance with section 224. Section 224 allows corporations to use electronic distributed ledger technologies such as blockchain to record their share books, as well as any issuance or transfer of shares made by the corporation[60]. In addition, Delaware corporate law has already advanced in several regulatory changes in favor of digitalization, pioneering the regulation of virtual shareholder' meetings, copied by several US states later[61]. One of the most relevant aspects in remote or electronic voting is the verification of the identity of shareholders or proxy holders[62], which is possible both inside and outside the blockchain.

On the other hand, if blockchain did not really serve for the registration of shares and their transfers, legal changes in several countries of the world would not be understood[63], and not only limited to EU Member States. [64]

3. A Problem in Listed Companies and the Stock Market

3.1. Shareholder absenteeism

[60] Delaware Law confers rights on registered stock owners. However, certain federal securities laws related to listed securities require that securities be "eligible for deposit," which, in practice, means that investors own them indirectly. When investors own securities indirectly, what they legally hold is not a security, but a prorated portion of the fungible "securities rights" under Article 8 of the UCC, which are promissory notes issued by a "securities intermediary" (agent), which in turn, owns a prorated interest in the securities rights of other securities intermediaries, which in turn hold a prorated share of the actual securities that are the legal property of a nominee called Cede & Co., (in turn a nominee of The Depository Trust Company). In each of these layers above the broker/distributor, intermediaries account for fiduciary rights in an omnibus account. They do not look for the final beneficiary, but for the holders in aggregate form. TINIANOW, Andrea, LONG, Caitlin, «Delaware Blockchain Initiative: Transforming the Foundational Infrastructure of Corporate Finance», *Harvard Law School Forum on Corporate Governance and Financial Regulation*, 16/03/2017, https://corpgov.law.harvard.edu/2017/03/16/delaware-blockchain-initiative-transforming-the-foundational-infrastructure-of-corporate-finance/

[61] CAYTAS, Joanna D., «Blockchain in the US Regulatory Setting: Evidentiary Use in Vermont, Delaware and Elsewhere», 2017, available at SSRN.

[62] HASS, Steven M., BREWER, Charles, «Making the Switch: A Company's Guide to Virtual-Only Shareholder Meetings», *Hunton & Williams*, LLP 2017, p. 5: «Corporations must be able to verify that each remote participant is a shareholder or a proxyholder. As discussed above, most public corporations that hold virtual-only shareholder meetings delegate this process to a third-party service provider. Shareholder verification typically occurs by including a unique code in each shareholder's proxy materials that he or she can use to log in to the meeting website. If a shareholder casts a vote during the meeting, his or her unique code allows the proxy solicitor to ensure that the shareholder's proxy, if one was submitted, is replaced by the shareholder's vote cast during the meeting."» https://www.huntonak.com/images/content/3/4/v2/34044/companys-guide-virtual-only-shareholder-meetings.pdf

[63] For legal initiatives, see LEHMANN, *op. cit.*

[64] On December 10, 2020, the Ley de Modernización de la Ley de Compañías (Law of Modernization to the Law of Companies) (LMLC) was published in the Official Registry of Ecuador, which introduced, for the first time in Ecuadorian legislation, the possibility of using *blockchain* technology for the representation, registration and transfer of shares of public limited companies and simplified joint stock companies. GARRATE RIVERA, Luisa, «El Blockchain para la transferencia de acciones y la organización de libros sociales», *AD 36/2021*, 18/03/2021, https://adefinitivas.com/arbol-del-derecho/el-blockchain-para-la-transferencia-de-acciones-y-la-organizacion-de-libros-sociales-a-cargo-de-luisa-garate-rivera/

Shareholder absenteeism motivated by rational apathy can be due to several causes, among them, minority shareholders may think that their vote is not useful. The "passivity story" implies that shareholders do not care much about voting and are not expected to care[65]. Yet, apathy appears less if the number of shares in the hands of shareholders increases, and other large shareholders exist[66]. Institutional investors can have economies of scale which means that owns stakes in several companies and presses common issues at those companies[67]. However, institutional shareholders are considered "rationally reticent" instead of "rationally apathetic" as «intermediary institutional holders will respond to proposals but are unlikely themselves to create them»[68]. Moreover, institutional investors have conflicts of interest which may explain why institutions vote pro-managers even if proposals are likely to reduce share price[69].

The problem is that shareholders of Spanish listed companies are foreign depositories of shares bought by the real investors[70]. In the US approximately 80 % of shares are held by nominees[71]. US authors have identified several problems, like pathologies of complexity[72], pathologies of ownership[73] and pathologies of conflicts of interest between voting rights and economic interest[74]. In Spain there is a lack of legitimacy of the shareholder-investor vis-à-vis the company for exercise of his vote in accordance with the *lex societatis*. The direct consequence is a deficit in corporate governance and loss of functionality of the General Shareholders' Meeting. Nevertheless, this system is defended because it is considered that attributing legitimacy to the apparent shareholder or formal owner is more respectful of legitimation rules according to *lex societatis*, favoring legal certainty. Yet, the classic equation between risk, profit and power is lost, since the economic shareholder bears the risk but legitimacy to exercise the vote is held by the financial intermediary, who must act in his own name but on behalf of the client, and, therefore, in the interest of the real shareholder. That is why the financial intermediary can exercise the vote in a divergent manner if it has more than one client (art. 13.4. Directive 2007/36/EC) or delegate the vote to more than one representative (13.5. Directive 2007/36/EC). Article 524 of

[65] BLACK, Bernard S., «Shareholder Passivity Reexamined», *Michigan Law Review*, Vol. 89, No. 3, 1990, pp. 520-608, p. 526-527.

[66] *Ibid*., p. 524. For a recent analysis, see BRAV, Alon, CAIN, Matthew, ZYTNICK, Jonathon, «Retail shareholder participation in the proxy process: Monitoring, engagement, and voting», *Journal of Financial Economics*, Vol. 144, No. 2, 2022, pp. 492-522. («Analyzing turnout within a rational-choice framework, we find participation increases with ownership and expected benefits from winning and decreases with higher costs of participation.»)

[67] BLACK, Bernard S., *op.cit*., p. 524.

[68] GIBSON, Ronald J. and GORDON, Jeffrey N., «The Agency Costs of Agency Capitalism: Activist Investors and the Revaluation of Governance Rights», *Columbia Law Review*, Vol. 113, No. 4, 2013, pp. 863-927, p. 867.

[69] BLACK, Bernard S., *op.cit*., p. 225.

[70] In the US most individual shareholders hold their shares through brokers and are not the record holders of those shares. The New York Stock Exchange Rules allowed that the broker can vote the uninstructed shares in its discretion, usually the same as management recommendation. In 2010 the NYSE Rules changed so when shareholders do not return voting instructions to the broker, these shares are not voted in the election of directors. KAHAN, Marcel, ROCK, Edward B., «The Insignificance of Proxy Access», *Virginia Law Review*, Vol. 97, No. 6, 2011, pp. 1347-1434, p. 1361.

[71] KAHAN, Marcel, ROCK, Edward B., «The Hanging Chads of Corporate Voting», *The Georgetown Law Journal*, Vol. 96, 2008, pp. 1227-1281, p. 1231.

[72] *Ibid*., pp. 1249-1253.

[73] *Ibid*., pp. 1255-1262.

[74] *Ibid*., pp. 1263-1266.

the Spanish Corporate Act (LSC) clarifies this possibility in the Spanish legal system, which may have a significant impact on cross-border voting[75].

3.2. Source of the problem: the securities holding system

The securities holding system is characterized by dematerialization, so issuance (or reissuance) of securities is not represented by a certificate or physical title but a system of registration in account of either an issuer or an intermediary[76]. In a system of indirect holding of shares, such as the Spanish one[77], foreign investors are not registered in the domestic register directly[78]. In such a way there is a divergence between who holds the formal ownership and who holds the economic or real ownership. Formal ownership falls on the foreign custodian whose name appears in the detailed registers by the entities participating in the central registry while economic ownership falls on the real investor, the one who bears the risk of investment. Article 13(1) of the Spanish Securities Market Act (LMV) is relevant, since it specifies that the person who appears legitimate in the entries of the accounting register will be presumed to be the legitimate owner and, consequently, may demand that the issuing entity perform in his favor the services to which the value represented by means of book entries entitles. In turn, also for the transfer and exercise of the rights that correspond to the owner, prior registration in his favor will be required [art. 13(3) LMV].

In addition, there is a double step system. On the one hand, there must be a central securities depository, which in the case of Spain is Iberclear. On the other hand, there must be detailed records in charge of the entities participating in Iberclear [art. 9(1) LMV][79]. In practice, neither

[75] Cross-border voting in Spain is regulated for the first time as a transposition of the 2007 Directive. Before that date, the Spanish legal system only had recommendation 6 of the 2006 Code of Good Governance that recognized the practice that occurred in listed companies on divergent voting.

[76] For a definition of dematerialisation, *UNIDROIT Legislative Guide on Intermediated Securities*, Implementing the Principles and Rules of the Geneva Convention 2017, https://www.unidroit.org/instruments/capital-markets/legislative-guide/ p. xxv. SÁNCHEZ ANDRÉS, Aníbal, «Valores anotados y construcción jurídica de las anotaciones en cuenta», *Revista del Mercado de Valores*, 1(2007), pp. 3-38, p. 37. See also GARCIMARTÍN ALFÉREZ, Francisco José, «The UNIDROIT Project on Intermediated Securities: Direct and Indirect Holding Systems», *InDret* 1.2006, pp.1-21.

[77] Preamble to Law 5/2021, 12 April 2021, section IV: «The peculiarity of regulated markets in Spain, such as the stock exchange, is that they are systems of indirect holding of shares and double step.» If we originally had a system of direct tenure, the fact of having a double step and not appearing the last beneficiaries in the registry, makes us *de facto* a system of indirect tenure. For example, GARCÍA MARTÍNEZ describes the Spanish system as direct type of tenure but with double step, only those who appear in one of the two steps of the registry are presumed to be the legitimate owner. GARCÍA MARTÍNEZ, Luz, «Consideraciones iniciales sobre la tecnología de registro distribuido (blockchain) como herramienta emergente de identificación e implicación accionarial», en FERNÁNDEZ TORRES, Isabel, *et al* (Coords.), *Derecho de sociedades y de los mercados financieros: libro homenaje a Carmen Alonso Ledesma*, 2018, pp. 371-393, p. 372.

[78] GARCIMARTÍN ALFÉREZ, Francisco José, SÁNCHEZ FERNÁNDEZ, Sara, «Valores negociables y custodia internacional: algunas cuestiones fundamentales», en MARTÍNEZ FLÓREZ, Aurora, GARCIMARTÍN ALFÉREZ, Franciso, RECALDE CASTELLS, Andrés Juan (Dirs.), *La reforma del sistema de poscontratación en los mercados de valores*, Thomson-Reuters-Aranzadi, 2017, pp. 797-830, pp. 800-801.

[79] Article 9.1. LMV: Any central securities depository providing services in Spain shall adopt a registration system composed of a central registry and the detailed registers in charge of the entities participating in that system (own translation).

Iberclear nor the issuer has immediate access to the detailed records of Iberclear's participating entities.[80]

The formal holder could be called «fiduciary holder» because he is nothing more than an intermediary, acting on behalf of the final investors. However, formal holders, who are those who appear in the relevant registry[81] before the company, enjoy the legitimacy of the exercise for the right to vote, that is, they have their own legitimacy to vote. [82]

It is noteworthy that the reform carried out in article 524 of the Spanish Corporate Act (LSC) by Law 5/2021, of April 12[83], only modifies two terms. In the first section, ultimate beneficiaries («beneficiarios últimos») instead of "persons" (art. 524.1 LSC). In the second section, ultimate beneficiaries instead of "indirect holders" (art. 524.2 LSC). Law 5/2021 introduces the definition of ultimate beneficiary (art. 497 bis, paragraph 2 LSC), which appears for the first time in Spanish law. This definition is very welcome. An ultimate beneficiary is conceptualized as the person on behalf of whom the intermediary entity acts legitimized as a shareholder by virtue of the account record, either directly or through the chain of intermediaries. It should be added that the Directive 2017/828 does not impose a concept of shareholder, or less of ultimate beneficiary[84]. Therefore, these new terms do not come from Directive (EU) 2017/828 of 17 May 2017 amending Directive 2007/36/EC as regards the promotion of long-term shareholder engagement.[85]

Directive 2017/828 does not seek to make identity of the ultimate beneficiaries known, so Spanish law goes beyond what is required by the Directive in Article 527 bis (1) of the LSC, insofar as the ultimate beneficiaries do not have to hold the status of shareholder in Spanish law, since the status of shareholder falls on the formal holder. However, in France, Italy, Lithuania, Slovakia, Austria, Belgium, Croatia, Hungary, Czech Republic, Romania and Latvia they do

[80] GARCIMARTÍN ALFÉREZ, Francisco José, «Ejercicio del derecho de voto e intermediarios financieros: el infeliz artículo 524 LSC», *Revista de Derecho de Mercado de Valores,* nº 10, 2012, section Introducción.

[81] For these purposes, the central registry or the detailed records of the entities adhered to the central registry of Iberclear.

[82] Although it can also be a *nominee*, a representative in proper name. Legislative Principle 11: The law should facilitate the exercise of those rights by the ultimate account holder, in particular, by allowing intermediaries who act on behalf of account holders to exercise voting rights or other rights in different ways, and should recognise holding through representatives other than intermediaries (i.e. nominees). *UNIDROIT Legislative Guide on Intermediated Securities*, Implementing the Principles and Rules of the Geneva Convention 2017, p. 99.
Art.29(1) UNIDROIT Legislative Guide, para. 241. «It is crucial the recognition of intermediated holding systems to ensure cross-border compatibility of the various models of holding systems. Contracting States shall permit publicly traded securities (i.e. the securities traded on exchanges or regulated markets of the corresponding Contracting State) to be held through one or more intermediaries and recognise the effective exercise of the rights attached to those securities, and such recognition works with all the models, as well as mixed and transparent systems».

[83] Ley 5/2021, de 12 de abril, por la que se modifica el texto refundido de la Ley de Sociedades de Capital, aprobado por el Real Decreto Legislativo 1/2010, de 2 de julio, y otras normas financieras, en lo que respecta al fomento de la implicación a largo plazo de los accionistas en las sociedades cotizadas. «BOE» núm. 88, de 13 de abril de 2021.

[84] The very definition of shareholder is divergent in national systems, which is relevant to know who the legitimate ones for voting in a company are. ESMA, *Report on the shareholder identification and communication services*, 5 of April 2017, p. 18.

[85] DOUE L 132/1, 20.5.2017.

recognize the ultimate beneficiary as a shareholder[86]. In contrast, together with Spain, Portugal, Slovenia, Bulgaria, Cyprus, Estonia, Germany, Greece, Ireland and the United Kingdom, they recognize the registered holder as a shareholder. On the other hand, thirteen countries grant the ultimate beneficiary the right to vote (Austria, Belgium, Bulgaria, Croatia, Denmark, Finland, France, Ireland, Italy, Lithuania, Latvia, Poland and the Slovak Republic). However, only the formal holder has the right to vote in Spain, Cyprus, Czech Republic, Hungary, Iceland and Slovenia. To which it must be added that the right to vote is held by the formal holder, but it can be transferred through the chain of intermediaries to the ultimate beneficiary in Portugal and the United Kingdom[87]. Nevertheless, the Spanish system gives ultimate beneficiaries the option to apply for confirmation of votes corresponding to their shares[88].

3.3. Steps towards modernization of company law

Modernization of company law had the objective of strengthening the rights of shareholders of listed companies. Problems generated by cross-border voting should be resolved, especially for small investors not resident in the country in which the company has its shares admitted to trading on an official secondary market. In 2003 the EU Commission alluded to maximizing the benefits of modern technologies because the rapid development of new information and communication technologies (videoconferencing, e-mail and especially the Internet) is affecting the way in which information about companies is stored and disseminated, as well as the way in which they are directed (virtual general assemblies, boards of directors via video, cross-border exercise of voting rights, etc.)[89]. Indeed, the proposal for a Directive amending the First Company Law Directive of June 2002 already included requirements for the provision of information in respect of certain types of companies and introduced modern technologies into business registers[90]. However, in 2003 it was felt that the time was not yet ripe to allow companies to systematically impose the use of new technologies on their partners and third parties without necessary protections[91]. The European legislator in different directives was aware that amendments to his original proposals would make the most of modern technologies as companies could file their documents and information on paper or electronic form and interested parties could obtain copies by both means. «Electronic means» are already defined and regulated from creation to dissolution of companies which is possible through the Commercial Registry.[92]

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[86] ESMA, *Report on shareholder identification and communication systems*, 2017, ESMA31-54-435, p. 10. Available in: https://www.esma.europa.eu/sites/default/files/library/esma31-54-435_report_on_shareholder_identification_and_communication.pdf

[87] Ibid. It is also curious that seven States do not respond with a single answer about the vote.

[88] Article 527 *bis* (2) LSC. This article was added by the Law 5/2021, of April 12, art.3.19.

[89] Communication from the Commission to the Council and the European Parliament - Modernising company law and improving corporate governance in the European Union - A plan for moving forward, WITH(2003) 284 final.

[90] Art. 3 the proposal for a Directive amending the First Company Law Directive of June 2002, OJ EC 227 E/337, 24.9.2002.

[91] Action Plan 2003, heading 2. Main objectives.

[92] Art. 16 (2) Directive 2017/1132 of the European Parliament and the Council of 14 June 2017 on certain aspects of company law (codified version), OJEU L 169/46, 30.6.2017, the term 'by electronic means' shall mean that the information is sent initially and received at its destination by means of electronic equipment for the processing (including digital compression) and storage of data, and entirely transmitted, conveyed and received in a manner to be determined by Member States by wire, by radio, by optical means or by other electromagnetic means.
However, Directive (EU) 2019/1151 of the European Parliament and of the Council of 20 June 2019 amending Directive (EU) as regards the use of digital tools and processes in the field of company law, OJEU L 186/80, 11.7.2019, has introduced a new definition of «electronic media» art.13a (3): electronic equipment used for the

a. Shareholder Rights Directive I

The first European attempt to approach strengthening shareholders' rights was forged by Directive 2007/36 on the exercise of certain rights of shareholders of listed companies, allowing electronic participation in general meetings and European voting (Article 8 of Directive 2007/36). However, this Directive does not define who the shareholder is, and this determination is left to national legislative initiative[93]. The law of the State of the issuer's registered office has jurisdiction to determine it [Art. 1(2) of Directive 2007/36].

On the one hand, the Directive activates mechanisms, so that the information is sent or made available to shareholders before the General Meeting, with a minimum of 21 days before the meeting date. This possibility is significant since only those who are shareholders on that date can participate and vote at the General Meeting[94]. In addition, the company is obliged to report on the total number of shares and voting rights on the date of the call, including if the capital is divided into more than one class of shares[95]. Shareholders may also submit draft resolutions, which should be added to the website as soon as possible once the company has received them[96]; and shareholders will be provided with the forms to delegate the vote or to vote remotely (by correspondence)[97].

On the other hand, the Directive removes voting obstructions. The shareholder right to participate in a General Meeting and to exercise the voting rights corresponding to any of his shares is not subject to the requirement that such shares be deposited with another natural or legal person, or be transferred to him or registered in the name of that person, before the General Meeting date[98], and neither is the shareholder's right to sell or otherwise transfer his shares during the period between the date of registration and that of the corresponding General Meeting subject to restrictions other than those applicable at any other time.[99]

b. Shareholder Rights Directive II

processing, including digital compression, and the storage of data, and through which information is initially sent and received at its destination; that information being entirely transmitted, conveyed and received in a manner to be determined by Member States.

[93] In the Proposal for a Directive of 5 January 2006 defined shareholder, [Art. 2(c)] as «any natural or legal person governed by public or private law holds: (i) shares of the issuer in its own name and for its own account; ii) shares of the issuer in its own name, but on behalf of another natural or legal person. » MARTÍNEZ ROSADO, Javier, «La propuesta de Directiva del Parlamento Europeo y del Consejo (presentada por la Comisión el 5 de enero de 2006)», Documentos de Trabajo del Departamento de Derecho Mercantil UCM, 2008/16, eprint, p. 8.

[94] Art. 5.3 (c) Directive 2007/36. Art. 517.1. LSC added by the Law 25/2011, of 1 August, on the partial reform of the Capital Companies Law and on the incorporation of Directive 2007/36/EC, of the European Parliament and of the Council, of 11 July, on the exercise of certain rights of shareholders of listed companies.

[95] Art. 5.4 (b) Directive 2007/36. Art. 518 (b) LSC. «En caso de que los estatutos contemplen la atribución de voto doble por lealtad y se haya creado el registro especial a que se refiere el artículo 527 septies, la información relativa al número de derechos de voto deberá actualizarse inmediatamente tras la finalización del plazo de legitimación anticipada previo a la reunión de la junta general», new Law 5/2021, of April 12.

[96] Art. 5.4 (d) Directive 2007/36. Art. 518 d) LSC.

[97] Art. 5.4 (e) Directive 2007/36. Art. 518 f) LSC.

[98] Art. 7.1 (a) Directive 2007/36.

[99] Art. 7.1 (b) Directive 2007/36.

Shareholder Rights Directive II is marked by transparency requirements in transmission of information between issuing companies and investors[100]. The intermediary chain system is maintained despite awareness of obstacles they pose to shareholder involvement; precisely because information is not always transmitted from the company to shareholders and votes are not always transmitted correctly to the company[101]. This second Directive is intended to improve communication of information. Duties are imposed on intermediaries at the level of facilitating the exercise of shareholders' corporate rights. In case the intermediary is the shareholder's representative, he must have express authorization and must follow the voting instructions of shareholders[102]. In turn, confirmation of the vote receipt must be made provided that the vote is by electronic means. Intermediaries shall be bound by these duties even if they are located in third states as long as they provide services to shareholders or other intermediaries in relation to shares in companies having their registered office in a Member State and whose shares are admitted to trading on a regulatory market which is situated or operates in a Member State[103].

Given the increase in proxy advisors for institutional investors, who often get vote delegations in favour of the board of directors and play a significant role in the struggle for corporate control[104], the Shareholder Rights Directive II requires them to apply a code of conduct and report on its application[105]. It also requires publication on the websites of voting advisors of their activities, calculation methods and sources of information, as well as procedures for voting recommendations, including essential characteristics of voting policies of each market and prevention and management of potential conflicts of interest implies greater transparency to know the significance of voting advisors. On the other hand, shareholders are granted the right to vote at the General Meeting on the remuneration policy of directors, helping involvement of shareholders to reward or punish directors' management[106].

c. Inconsistencies of the Shareholder Rights Directive II

Shareholder Rights Directive II expressly states this Directive does not concern ultimate beneficiaries or other persons who are not shareholders under the applicable national law (recital 13 SRD II). This legislative policy is in contradiction with recitals 16 and 19 of the Shareholder Rights Directive II. Specifically, it alludes to lack of transparency between institutional investors and asset managers about their investment strategies and engagement policies, about their implementation and it is considered that «Public disclosure of such information could have a positive impact on investor awareness, enable ultimate beneficiaries such as future pensioners optimize investment decisions, facilitate the dialogue between companies and their shareholders, encourage shareholder engagement and strengthen their accountability to stakeholders and to civil society». [107] Recital 19 of SRD II affirms that «institutional investors should disclose to the public certain key elements of the arrangement with the asset manager, in

[100] Directive (EU) 2017/828 of 17 May 2017 amending Directive 2007/36/EC as regards the promotion of long-term shareholder engagement, OJ L 132/1, 20.5.2017 (hereinafter Directive 2017).
[101] Directive 2017, Recital 4.
[102] Directive 2017, Recital 8.
[103] Directive 2017, Art. 3 *sexes*.
[104] ALONSO UREBA, ALBERTO, GARCIMARTÍN ALFÉREZ, FRANCISCO, PERDICES HUETOS, ANTONIO, GÓMEZ-SANCHA TRUEBA, IGNACIO, *Transparencia Accionarial Y Buen Gobierno,* Centro De Gobierno Corporativo, 2010.
[105] Directive 2017, Art. 3 *undecies*.
[106] Directive 2017, Art. 9 *bis* and *ter*.
[107] Directive 2017, Recital 16.

particular how it incentivizes the asset manager to align its investment strategy and decisions with the profile and duration of the liabilities of the institutional investor». It is intended to ensure that interests of ultimate beneficiaries are properly harmonized with institutional investors, asset managers and the companies in which it is invested.

However, divergences in national laws on shareholder status cause the European legislator to throw in the towel and not attempt a harmonized shareholder regulation, which is criticized as one of the improvements to be built in European company law. Although there are no problems for dividends collection, it is an obstacle to the exercise of voting rights in situations of purchase and sale of shares between the date of registration and the date of the Meeting, where it may be impossible to trace the ultimate beneficiary on the date of registration, who are granted the right to vote by law[108]. If in that interval many shares are traded, there will be more likelihood of shares subject to empty voting at a General Shareholders' Meeting. On the contrary, in the case of short sales and hedge funds, the borrowed shares have voting rights. However, more than one vote of the same shares may occur if the ultimate beneficiaries do not know whether their shares have been lent to third parties by their custodians and, therefore, believe by mistake, that they have the right to vote for the borrowed shares they hold in their accounts. In turn, borrowers also believe they have acquired the right to vote on borrowed shares. Thus, with the ultimate beneficiaries there is an inertia to situations such as those described above.

It does not change this situation that intermediary entities legitimized as shareholders in the accounting register of shares can split the vote and exercise it in a divergent sense in compliance with different voting instructions if they had received them. Consequently, the legitimated intermediary may vote in a divergent direction to the instructions received by the ultimate beneficiary. Moreover, the intermediary may delegate the vote to both the ultimate beneficiaries and third parties who are designated by the ultimate beneficiaries.

d. Result of both Directives

While the first EU Directive (2007/36) focused on expanding formal rights of shareholders within the context of the General Meeting, the second EU Directive (2017/828) addresses the requirements of transparency and dialogue with investors as transformative tools for corporate governance in the hands of investors. It is intended that active control return to investors, and in turn it attempts to ensure the long-term survival of companies within the framework of the EU agenda for long-term sustainability after the 2008 financial crisis. Indeed, company law is marked by the fear of abuse of control by the board of directors to the detriment of real investors[109]. Some authors consider that Shareholder Rights Directive II can be described as too optimistic since it conveys the idea that increasing requirements for transmission of information in the chain of financial intermediaries will lead to greater involvement and control by company shareholders[110]. The challenge facing the Directive is to accept interposition of intermediaries

[108] VAN DER ELST, Christoph, LAFARRE, Anne, «Blockchain technology for corporate governance and shareholder activism», *ECGI Working Paper (series Law)*, nº 390, March 22, 2018, pp. 1-26.

[109] CHANDER, Anupam, «Minorities, Shareholder and Otherwise», *Yale Law Journal*, Vol. 113, No. 1, 2003, pp. 119 and ff., p. 150.

[110] *See* AHERN, Deirdre, «The Mythical Value of Voice and Stewardship in the EU Directive on Long-term Shareholder Engagement: Rights Do Not an Engaged Shareholder Make», *European Union Law Working Papers*, No. 32, 2018, p. 3.

but at the same time to recognise that those who formally appear as shareholders are actually acting on behalf of third parties (their clients)[111]. These third parties are the ultimate beneficiaries. Since the Directive purports to facilitate the exercise of the right to vote, it lays down limits on the national obligations to be fulfilled by intermediaries, so that they do not constitute obstacles to their exercise of the right to vote.[112] One of the most apt criticisms of the Shareholder Rights Directive II is that obligations imposed on intermediaries and issuing companies are not punishable by consequences in the event of non-compliance.

e. Efficiency gains helping compliance with Commission Regulation (EU) 2018/1212

Voting via blockchain would also help to comply with the recent transposition of Directive (EU) 2017/828 on fostering long-term shareholder engagement. In this case, blockchain technology would align with efficiency, as it would be developed to complement national corporate law.[113]
It is relevant to mention Commission Regulation (EU) 2018/1212 of 3 September 2018 laying down minimum requirements for implementation of Directive 2007/36/EC of the European Parliament and of the Council as regards the identification of shareholders, the transmission of information and the facilitation of the exercise of shareholders' rights[114]. Recital (3) of the last Commission Regulation refers to minimum requirements, encouraging intermediaries and participants towards self-regulation of formats according to market's needs. It is encouraged to standardize or distribute any type of message that is necessary to facilitate the exercise of shareholders' rights, adopting new technologies capable of increasing transparency and trust. For example, with regard to time limits to be observed by issuers and intermediaries in corporate acts and shareholder identification processes, it is regulated that between the first intermediary and any other intermediary receiving information relating to a corporate act, that information must be transmitted as soon as possible, giving a maximum of one working day of difference when the information has been received by the intermediary after 4:00 p.m[115]. In turn, a period of up to 15 days is foreseen to confirm registration and counting of votes, although confirmation of vote must be sent immediately to the person who voted after the vote[116].

Blockchain would allow this information to be transmitted in real time and regardless of whether the communication was cross-border, a particular problem on which standardization of information to be transmitted between the chain of intermediaries is focused and the objective of the Commission Regulation is none other than to make it efficient[117].

4. Alternative for voting rights in listed companies

[111] GARCIMARTÍN ALFÉREZ, Francisco J., «La propuesta de Directiva sobre el ejercicio transfronterizo de los derechos de voto», *Revista de Derecho de Sociedades*, 2006-1, pp. 203 and ff.
[112] Recital 11 Directive 2007/36.
[113] *See* the tripartite distinction from the author YEUNG, Karen. «Regulation by Blockchain: The Emerging Battle for Supremacy between the Code of Law and Code as Law», 2018, available on: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3206546 (accessed on 24/03/2022)
[114] OJEU, L 223/6, 4.09.2018, which is applicable from 3 September 2020.
[115] Implementing Regulation (EU) 2018/1212, Art. 9(2).
[116] Implementing Regulation (EU) 2018/1212, Art. 9(5).
[117] Implementing Regulation (EU) 2018/1212, Recital 9.

If we believe that the right to vote remains the fundamental political right for effective governance of companies exercised at the General Meeting[118], it turns out that lack of transparency due to chains of intermediaries in the possession of shares of listed companies remains a problem. Firstly, companies have problems identifying its shareholders, which is a prerequisite for communication with shareholders. Such a situation creates an obstacle to involvement of shareholders in the long-term running of companies and hinders shareholders' rights. Indeed, the European Commission's 2012 Action Companies Plan[119] already mentioned the need for a European mechanism to help issuers identify their shareholders to facilitate dialogue on corporate governance issues. This need connects with an active attitude from shareholders as one of the cornerstones of the corporate governance model of listed companies, which depends on a balance between the various bodies and stakeholders[120]. Therefore, there is a need for greater shareholder influence over policies and strategies designed by managers, for the simple reason that it is the shareholders who bear the risk of transactions. These inefficiencies of corporate governance due to the preponderant role assumed by directors cause certain distortions that need to be avoided through a stronger position of shareholders. This is the aim of Directive 2017/828 together with Commission Implementing Regulation 2018/1212 of 3 September 2018 laying down minimum requirements for the implementation of the provisions of Directive 2007/36/EC of the European Parliament and of the Council as regards the identification of shareholders, the transmission of information and the facilitation of the exercise of shareholders' rights.[121]

The traditional problem of lack of operability of the General Meeting is attributed to the fact that there is a large volume of shareholders in large, listed corporations, which hinders both their constitution and effectiveness. Regarding its constitution, forecast of fully telematic meetings fueled by the pandemic need are today a closer reality and not a technical impossible[122], whose validity was questioned in the previous regulation, and, above all, the cyber vote had little success in listed companies[123]. In this context, arrangement of vote through blockchain can radically change distribution of the social and economic order for the reason that a trusted third party is not needed to guarantee the validity of the vote.

Thus, voting can be done by simplifying in two ways: A) with a trusted third party and B) without a trusted third party. This second possibility is where blockchain comes in.

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[118] SÁNCHEZ CALERO, Fernando, *La Junta General en las Sociedades de capital*, Cizur Menor, Civitas, 2007, p. 37: «The general meeting is the special way of organizing all the partners so that they can deliberate and adopt resolutions, open to all shareholders so that through their vote they can form the will of the body and, ultimately, that of the company itself» (own translation).

[119] Communication from the European Commission, Action plan: European company law and corporate governance - a modern legal framework for greater shareholder participation and the viability of companies, COM/2012/0740 final.

[120] European Commission Action Plan 2012: «If, for example, the majority of shareholders maintain a passive attitude, do not seek interaction with the company and do not exercise their right to vote, the functioning of the current corporate governance system is less effective. In such circumstances, corrective action by shareholders cannot be expected, and management oversight rests entirely with the board of directors (supervision). »

[121] DOUE, L 223/1, 4.9.2018.

[122] See in this work, section 5.2.

[123] SÁNCHEZ CALERO, *La Junta..., op.cit.*, pp. 50-51, who anticipated that it would be the most widespread telematic vote in medium-sized companies, with a small number of partners residing in different States.

4.1. With trusted third party

An example of a provider of electronic voting services is offered by Innovoto. It is a platform specially developed for the incorporation of electronic voting and delegation of electronic representation in the General Shareholders' Meetings, as well as in other participation bodies. According to information on the website of the European Agency of Digital Trust (EADTrust) [124], with Innovoto authentication of participants is carried out in a simple and guaranteed way thanks to the use of cryptography. A verification method is implemented through the calculation of a custom hash for each user, which relates a series of personal parameters to random components. In this way, the hash uniquely identifies the voter[125].

A third party[126] has the advantage that contractors will only see the vote count and the voters who registered on the platform, but they will not be able to know who voted for each alternative. The form of authentication is varied, depending on the method chosen by the company. It may be through digital certificates, registration processes or the intranet of the company with access to the vote after user / password authentication by the entity itself. This tool is useful both for voting on the agenda items of participatory events, such as shareholders' meetings and the process can be implemented in real time or in advance over a period. If the electronic vote is anticipated and the voter goes after making the face-to-face vote, usually his vote is withdrawn from the early voting platform. Otherwise, face-to-face vote would be limited if he has already voted electronically, although the key to use the system in the end lies in the company by-laws and in the call for the General Meeting since the services are personalized [127].

4.2. No trusted third party

One way to revolutionize voting could be through blockchain because it would reduce costs and simplify elections. In a political electoral context, it is believed that this would bring many more voters into elections, which would develop our democracies[128]. However, decentralizing voting would mean having to rely on the use of the internet or an isolated network, which could allow an unsupervised voting process using mobile phones and electronic tablets instead of physical ballots. In a decentralized voting system, tasks carried out by a central authority to verify

[124] EADTrust registered with the Ministry of Economic Affairs and Digital Transformation, as a qualified trust service provider, TSL List (*Trusted Service List*) published by the Subdirectorate General for the Digital Society integrated in the Secretary of State for Digitalization and Artificial Intelligence of the Ministry of Economic Affairs and Digital Transformation published on October 5, 2020. Its services are provided in accordance with the European Regulation (EU) No. 910/2014 Regulation eIDAS, on certifications based on high security, which is valid in any European State, regardless of the State of origin of the Qualified Provider.

[125] http://innovoto.com/caracterisiticas/ (accessed 20/03/2022)

[126] http://innovoto.com/preguntas-frecuentes/ (accessed 20/03/2022) Typically, platform customization and various organizational aspects of the process are managed by EADTrustin collaboration with the people in charge of the entity. Independence of management and simplifying the processes for the organizers are key aspects. The platform would incur liability for any improper action, among other aspects because the testimony it issues EADTrust collects aspects such as attendees, necessary quorum, results of votes and statistical data that may be of interest. The generated records are auditable and make any errors or manipulation very difficult. The criteria of independence and impartiality are part of the requirements of the audits that EADTRUST periodically passes, including ISO-27001 and EIDAS.

[127] It could also be implemented for electoral processes.

[128] BOUCHER, Philip, *What if blockchain technology revolutionised voting?*, European Parliamentary Research Service, September 2016.

identities, register votes, count and verify them would be carried out by the voters themselves having a copy as a registration on their smartphone or electronic device. Validation of votes would be established by a technological mechanism of consensus. In addition, in the voting of listed companies if the vote is combined with smart contracts, an automatic implementation of corporate decisions such as investment elections or other organizational decisions would be achieved.

Voting on blockchain can be implemented in two models mainly.

a. Most advanced model

The most advanced model would be for blockchain technology itself to make indirect shareholding systems disappear, so that ultimate investors would be listed as holders in the distributed ledger[129]. Therefore, they are the subjects legitimized to exercise the right to vote at the general meetings. This model means that intermediaries are eliminated and the current problems of companies with respect to knowing ultimate investors' identity are mitigated[130]. Some advantages are evident in having a very fast share transmission system on the blockchain network itself. Consequently, registers of the central securities depositories or registers of the entities adhering to them with the formal holder of the securities would be deleted[131]. Shares are securities originally issued as digital assets[132]. The same would happen if the shares were issued through traditional systems and subsequently tokenized on the blockchain[133].

«Tokenisation»[134] of shares permits transmission through the transfer of tokens representative of shares in a blockchain network itself[135], where the holder of the tokens is a shareholder[136]. However, article 496.1 LSC requires thatshares and participations of a company listed in Spain

[129] GALLEGO CÓRCOLES, «El Blockchain …», *op.cit*., p. 308.

[130] BENOS, Evangelos, GARRAT, Rodney, GURROLA-PEREZ, Pedro, 2017, «The economics of distributed ledger technology for securities settlement», *Staff working paper*, nº. 670, Bank of England, https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2017/the-economics-of-distributed-ledger-technology-for-securities-settlement 2019 published version available at: https://ledgerjournal.org/ojs/ledger/article/view/144/159

[131] Examples of Pilot Project in the report, EUROPEAN CENTRAL BANK, 2021, pp. 31-34.

[132] EUROPEAN CENTRAL BANK, 2021, p. 12.

[133] BENOS, GARRAT, GURROLA-PEREZ, 2017, p. 40.

[134] It is noteworthy that the Regulation (UE) 2022/858 of the European Parliament and of the Council of 30 May 2022, on a pilot regime for market infrastructures based on distributed ledger technology, and amending Regulations (EU) No 600/2014 and (EU) No. 600/2014 and (EU) No 909/2014 and Directive 2014/65/EU defines 'tokenisation' of financial instruments: the digital representation of financial instruments on distributed ledgers or the issuance of traditional asset classes in tokenised form to enable them to be issued, stored and transferred on a distributed ledger, is expected to open up opportunities for efficiency improvements in the trading and post-trading process. This definition in recital 3 was added at first reading by the European Parliament to the European Commission's proposal. However, as fundamental trade-offs involving credit risk and liquidity remain in a tokenised world, the success of token-based systems will depend on how well they interact with traditional account- based systems, at least in the interim.

[135] Tokens are digital assets or representations of the shares that are stored in the blockchain in code form and can be transmitted through *smart contracts*, *vid*., BEDNARZ, Zofia, «El uso de la tecnología blockchain en las sociedades cotizadas: la implicación de los accionistas», *Revista de Derecho de Sociedades,* No. 58, 2020, (consulted electronic version), section 2.

[136] GARCÍA MARTÍNEZ, 2018, pp. 385-387.

be represented by means of book entries. Therefore, in a restrictive interpretation of the LSC, without a legal authorization that allows to represent shares by digital assets in blockchain, such a possibility would not be feasible[137]. It is more than a computer change by the very structure of the network but what should be asked is whether such a change is worth it in the long run.

First, transparency would establish an accurate definition of shareholder[138], mitigating the difficulties of indirect holding of shares. Under the current system, issuers and custodians save money but not investors. It has even been shown that custody systems in the Anglo-Saxon world erode the rights of investors and reduce their assets' value because investors are exposed to the least favorable terms in contracts with custodians[139]. In our opinion, there are several options to solve the securities infrastructure, which would benefit the voting process in listed companies. The first option would be a reduction or elimination of custodians thanks to blockchain. A second measure that could be complementary is to promote the use of smart contracts with sub-custodians, codifying more equitable terms for investors.

Secondly, a system of direct holding of shares helps to encourage greater market credibility[140]. However, if the change is going to consist of having tokens in omnibus accounts managed by intermediaries, the change's magnitude is not appreciated if there are still intermediaries, in particular, new intermediaries appear with the digital system[141].

Thirdly, it is possible to comply more efficiently with the requirements of Directive 2017/828 (Article 3 quater 2) which requires the verification of the meaning of the vote in accordance with shareholders' instructions, being a novelty at European level[142]. One of the ways to comply with the right to erase personal data of the partner who has ceased to be so is to establish this information off-chain, and only the verification code of that document is preserved in the blockchain[143]. The other possibility would be that this data was encrypted within the blockchain, but not accessible to anyone after a period of time[144]. According to Article 497 paragraph 3 of the LSC, this period shall not exceed twelve months from the date on which they become aware that

[137] PEINADO GRACIA, Juan Ignacio, BEDNARZ, Zofia, «Cuestionando las bondades de la "blockchain" en las juntas generales. "un martillo buscando un clavo"», *Revista de Derecho de Sociedades,* No. 61, 2021, section III.2.

[138] PANISI, Federico, BUCKLEY, Ross P., ARNER, Douglas W., «Blockchain and Public Companies: A Revolution in Share Ownership Transparency, Proxy Voting and Corporate Governance? », *Stanford Journal of Blockchain & Policy*, Vol.2, No. 2, 2019, pp. 189-220, p. 211.

[139] MICHELER, Eva, «Custody Chains and Asset Values: Why Crypto-currencies are Worth Contemplating», *Cambridge Law Journal*, 2015, pp. 505-533, research gate version, p. 28.

[140] KOURETAS, Georgious, TARNANIDOU, Christina, «Shareholding in EU: is "indirect holding" approach appropriate in achieving financial integration"?»*Journal of Financial Regulation and Compliance*, vol. 22, No. 1, 2014, pp. 15-25. These authors are in favor of direct holding of shares and registry transparency, considering that the EU should push for greater integration through the inclusion of the real shareholders in the registers.

[141] *See* JIMÉNEZ-GÓMEZ, *op.cit*., pp. 297-298.

[142] SRD I did not require companies to check the meaning of the vote of representatives whether they vote according to the instructions of the shareholders they represent. *See* in this article, section 3.3.e.

[143] Art. 497.3 LSC forces treatment of the personal data in accordance with Regulation (EU) No 2016/679 of the European Parliament and of the Council of 27 April 2016 on the data protection of natural persons JIMÉNEZ-GÓMEZ, *op.cit*., p. 326 *et seq*. One example has developed Hyperledger, *vid*., Hyperledger In-depth: An hour with Joisto Group Oy- Enabling GDPR Compliant Storage with Hyperledger Fabric, https://www.hyperledger.org/event/hyperledger-in-depth-an-hour-with-joisto-group-oy-hybrid-blockchains-with-hyperledger-fabric, 21/04/2021, https://www.youtube.com/watch?v=Y7of9V-tq2w

[144] For various solutions, *see* JIMÉNEZ-GÓMEZ, *op.cit*., pp. 333-338.

the person has ceased to be a shareholder for companies, intermediaries and service providers, regardless of their location. In the case of shareholder associations and when personal data are held by shareholders, they may keep them for the time necessary to carry out the exercise of their rights and the best defense of their common interests. Therefore, it is understood that if the purpose was mentioned, there is no problem for the data to be kept on the blockchain.

Fourthly, intermediaries' fees would be saved. These fees can be charged for services provided to investors or to companies for the transmission of information would be saved (Article 3 *quinquies* Directive 2017/828). Collection of fees has not been absolutely prohibited for the company's information transmission services to shareholders or to a third party appointed by shareholders[145] ; or from shareholders with regard to the exercise of rights derived from their shares to the company[146]. This lack of prohibition squeaks with the fact that involvement of shareholders through their exercise of the vote is an objective of the Directive[147]. Article 3 *quinquies* of Directive 2017/828 allows member States to differ on the rules for intermediaries. Thus, intermediaries may charge fees for information transmission services relating to facilitating the shareholder to exercise the shares rights, within which the right to vote is paramount. For example, Spanish Law 5/2021 does not prohibit these fees by intermediaries, since Article 524 ter of the LSC is dedicated to transposing Article 3 *quinquies* of Directive 2017/828. It states that intermediaries must publish on their websites all applicable rates for information transmission services[148]. The only limit for such tariffs is that they cannot be discriminatory and must be proportionate to the actual costs incurred by intermediaries in providing the service[149]. Spanish law does not prohibit the fees of intermediaries,[150] but it enshrines the differences in rates charged for the provision of the same service depending on the client or his representative State of origin. These articles merely convey that they will be valid if they are duly justified and reflect the variation in the actual costs incurred for provision of the services in question. Lack of an absolute ban at European level on such tariffs creates a tariff market that is legally fragmented depending on the state of origin of the customer or his representative.

Fifth, blockchain allows voting prior to the General Shareholders' Meeting or during the Meeting without any need to appoint a representative who is physically present at the meeting as provided for in Article 521 paragraph 2 of the LSC. Issuance of the first bond with blockchain from start to finish was carried out by Santander in 2019[151]. The bond exists only on the

[145] Article 3 *ter* paragraph 1 Directive 2017.

[146] Article 3 *ter* paragraph 4 Directive 2017.

[147] *See* Article 522 *bis* of the LSC entitled "Facilitation by intermediary entities of the exercise of the rights of the ultimate beneficiaries" and Article 3 *quater* paragraph 1 Directive 2017 entitled "Facilitating the exercise of the rights of citizens" shareholders".

[148] Transposition of Article 3(1) *quinquies* Directive 2017.

[149] Transposition of Article 3(2) *quinquies* Directive 2017.

[150] Possibility for the Spanish legislature under Article 3(3) *quinquies* Directive 2017.

[151] *Santander launches the first bond with technology blockchain from start to finish,* Madrid September 12, 2019, https://www.santander.com/es/sala-de-comunicacion/notas-de-prensa/santander-lanza-el-primer-bono-con-tecnologia-blockchain-de-prin Banco Santander itself has been the issuer of the bond of 20 million dollars, while one of the Units of the Group has bought it at market price, with a quarterly coupon of 1.98%. Santander Securities Services has acted as an agent of the tokenisation and custodian of encryption keys. It has used the public blockchain Ethereum, one of the open-source technologies of blockchain more advanced. This has allowed the bank tokenise the bond safely and register it in a permitted way in the blockchain. The cash used to complete the

blockchain, which implies a first step for a possible secondary market of tokenized securities in the future. Moreover, in July 2022, BME, through Iberclear, BBVA and the Interamerican Development Bank (IDB), have completed the first bond issuance in Spain listed in a regulated market and registered using blockchain technology developed by ioBuilders[152]. According to the BBVA website, this platform could serve as a basis for future issuances in Spain and in Latin America and the Caribbean[153].

b. Mixed models

b.1. First type of mixed model

The identity authentication process is done outside the blockchain platform as it depends on a central certification authority. Ownership of shares is registered in the blockchain platform from communication carried out by the Central Securities Depositary, on the information in the records of the CSD. The blockchain system issues voting tokens for shareholders from CSD registration information. In such a way that shareholders can: view the information of the meetings and vote before or during the holding of the same meeting, transmit their voting rights to a representative, control the meaning of the vote of the representative and revoke the power of representation, consult information of the meetings and previous transactions. Custodians (banks that hold the securities) could: a) distribute the voting rights among the economic owners of the share quickly with the upload of a file to the system, or b) vote on behalf of their clients. As can be seen, intermediaries are responsible for raising the list of shareholders and the legal requirements are structured through smart contracts, such as the necessary quorum for the constitution of the general meeting and majorities for valid adoption of resolutions[154].

This system has been implemented at general meetings of Estonian listed companies by Nasdaq Tallinn[155]. The Estonian experiment was based on the e-residency program, which allows remote and secure identification using Estonian digital identities. This experiment was also carried out by the Abu Dhabi Stock Exchange and in 2017 the vote was organized at the General Meeting of shareholders of several listed companies[156].

investment (delivery against payment in blockchain) and the quarterly coupon have also been tokenised, that is, they have been represented digitally in the blockchain. Thanks to the automation of the bond, which has a maturity of one year, the number of usual intermediaries in these processes has been reduced, which has allowed a faster, more efficient and simpler operation. Santander CIB's objective is to collaborate with the most innovative customers and move from the project stage to product development.

[152] *BBVA, BME and IDB issue the first regulated bond in Spain registered with Blockchain*, 26/ 07/2022, available at https://www.bbva.com/en/bbva-bme-and-idb-issue-the-first-regulated-bond-in-spain-registered-with-blockchain/ (BBVA was tokenizer of digital money, but also the digital custodian, digital structurer and active bookrunner for the transaction. Citi has acted as agent. Iberdrola and Renta 4 have acted as investors in the bond.)

[153] *Ibid.*

[154] GÁLLEGO LANAU, María, «La aplicación de la tecnología de registro distribuido en la Junta General. Una primera aproximación», *Revista de Derecho de Sociedades*, No. 57, 2019, Section III.1.2.

[155] *Nasdaq And Estonia's E-Residency to Empower Shareholders on Estonian Stock Exchange*, CNN, Last modified: March 4, 2021 4:46 PM, available at: https://www.ccn.com/nasdaq-estonias-e-residency-empower-shareholders-estonian-stock-exchange/

[156] *ADX showcases blockchain voting at AGMs*, Finextra, 9/10/2017), https://www.finextra.com/pressarticle/71057/adx-showcases-blockchain-voting-at-agms

b.2. Second type of mixed model

Blockchain is used as a record and the vote is done with current means that are linked to the blockchain network. Applications connect to blockchain to record certain aspects of voting. In this application the use of blockchain is only a confirmation of the event that occurred outside. Shares are still represented by annotations in account. Firstly, technology- by creating tokens- has a merely complementary function, which is possible without modifying the current legislation in Spain. Secondly, given that there are two key moments for voting at a General Meeting, the blockchain will have to allow registration of sending of instructions from the ultimate investor to the formal holder of the shares at the time prior to issuance of the vote, and also the registration of the vote received by the issuer at the end of the voting process. Tests at Boadbridge, in the consortium of J.P. Morgan, Northem Trust and Banco Santander for the 2018 Board used this type of mixed model.

This type may be suitable for voting on the policy of remuneration of directors[157], such a vote may be consultative according to national legislation[158]. It is also not recommended that the report on remuneration of directors was in blockchain, since the company must delete all personal data from the remuneration report at the end of the ten-year period[159], posing a technical problem in blockchain. The Shareholder Rights Directive II requires that the remuneration policy, the date and the result of the vote to be published without delay on the company's website and to be publicly accessible free of charge for as long as it is applicable[160]. Spanish legislation does not introduce a specific deadline, as it is limited to the fact that it will be accessible from its approval[161].

5. Blockchain is nothing more than a technical solution

5.1. Economic interests and regulation

We hope that it does not happen with the invention of blockchain as with the electric motor invention whose origins date back to the early nineteenth century, and at the beginning of the last century the percentage of electric cars in circulation exceeded that of gasoline[162]. However, acceptance of electric cars was initially hampered by lack of infrastructure for recharging energy, which together with oil reserves discovery and mass production of vehicles initiated by Henry Ford made us forget about electric cars. However, in 2019, the patent for the first electric Ferrari was registered with the U.S. Patent Office and Ferrari announced its first vehicle on the market by 2025[163]. Is it really a consumer demand or are we moving globally towards less polluting and more sustainable economies in the wake of regulation?

[157] *See* Art. 9 *bis* s. 1 Directive 2017.

[158] *See* Art. 9 *bis* s. 3 Directive 2017. In Spain, it has consultative status, art. 529 *novodecies* s. 7 LSC.

[159] *See* Art. 9 *ter* s. 5 Directive 2017.

[160] *See* Art. 9 *bis* s. 7 Directive 2017.

[161] *See* Art. 529 *novodecies* s. 2 LSC.

[162] KIRSCH, David, «The Electric Car and the Burden of History: Studies in Automotive Systems Rivalry in America, 1890-1996», *Business and Economic History*, vol. 26, No.2, 1997.

[163] DUFFY, Tyler, «Ferrari Is Going Electric, but This New Patent Proves You Shouldn't Worry», Updated: Feb 20, 2022, https://www.gearpatrol.com/cars/a39024170/ferrari-electric-car-patent/ GUTIERREZ, Diego, «Ferrari registers the patent of its first electric car and reveals interesting secrets», 8/02/2022, (accessed 27/03/2022)

Voting through blockchain aims to give back to risk-bearing investors their right to exercise their fair share in a more transparent, securer and more efficient way. If there are apathetic investors in a rational way, no technology may change that human psychology, but what seems clear is that a direct relationship of investors with company facilitates communication and, therefore, transmission of all the information on which shareholders must exercise their right to vote. Transparency helps to understand many processes because it uncovers the hidden strategies that may exist within the board of directors. It does not mean that filling investors in listed companies with reports will produce an understanding and processing of such information. However, the possibility of having everything at hand revolutionizes the meaning of a General Shareholders' Meeting, to such an extent that any need to hold such a physical or telematic meeting is questioned if the information necessary for the issuance of votes is available with a reasonable time for investors.

5.2. Post-pandemic companies

Certain studies predicted that virtual boards would not be successful in Spanish listed companies due to preference for physical assistance[164]. Yet this trend has not been possible to maintain during the COVID-19 pandemic and enabling of technology by Royal Decree-Law has been necessary, so it may be risky to try to predict the future. In a new environment of enabling the holding of fully telematic meetings (article 182 bis LSC after the reform of Law 5/2021). This possibility admitted until then only exceptionally, and even without statutory provision at the beginning of COVID-19,[165] becomes permanent. Therefore, even the Chairman and the secretary of the Board are dispensed with, since it is presumed that the shareholders' meeting is held at the registered office, regardless of where the Chairman of the Board is located (art. 186 bis 6 LSC). However, for fully telematic meetings to have a vocation of permanence, they must be expressly provided for in the companies by-laws and such modification must be approved by a qualified majority (two thirds of the capital present or represented at the meeting). Similarly, the pandemic has changed the way shareholders' meetings are held in other EU Member States.[166]

5.3. At the expense of intermediaries

In a comparison with holding of shares given its relationship with voting in listed companies, we believe that, in the shareholding market, it does not seem that an optimal system is wanted, just a cheap system is in place. An example is the concordance of the authorized post-mailing

https://www.hibridosyelectricos.com/articulo/mercado/patente-ferrari-electrico-secretos/20220208130418054290.html

[164] *See* GÁLLEGO LANAU, *op.cit*., epígrafe III. 1.5.C, electronic version.

[165] Real Decreto-ley 8/2020, de 17 de marzo, de medidas urgentes extraordinarias para hacer frente al impacto económico y social del COVID-19 «BOE» núm. 73, de 18/03/2020. Real Decreto-ley 11/2020, de 31 de marzo, por el que se adoptan medidas urgentes complementarias en el ámbito social y económico para hacer frente al COVID-19. «BOE» núm. 91, de 01/04/2020. (RDL 8/2020 and RDL 11/2020).

[166] MADISON, Karin *et al*, «Estonian corporate update: participation and voting at virtual meetings becomes widely available», 12 May 2020, *Lexology*, https://www.lexology.com/library/detail.aspx?g=b5fbba2f-9714-4ae3-9c58-3747892f80b5 «Electronic measures used for meetings must be secure and enable two-way real time or other similar connection, so that participants can observe the meeting, as well as speak and vote. The management board should also identify the participants and verify representation rights. This means that management boards will need to set rules for holding virtual meetings and ensure that all members have an equal opportunity to participate and vote. Finding a suitable electronic platform for convening a meeting is a challenge.»

reconciliation in the United States, necessary for imbalances to agree on the shareholder position, which entails the right to participate in general meetings and vote in them. Imbalances occur in omnibus accounts[167] because ownership of individual shares does not follow the pre-mailing system. That is, allowing shareholders to know the exact number of votes they can deposit prior to the vote[168].

However, post-mailing reconciliation system is used because it is cheaper than the alternative, not because it is better. Intermediaries are the ones who choose between systems. Therefore, it is not surprising that despite having made pilot tests[169] of blockchain voting, it has not been implemented at a general level in listed companies since financial institutions act as asset managers, custodians and sub-custodians in the stock market.[170]

Nevertheless, a regulation of the European Parliament and of the Council on a pilot regime for market infrastructures based on decentralized registration technology raises the possibility of creating a test environment, called a sandbox, to experiment with this technology[171]. Soft law previously in the OECD Principles of Corporate Governance indicated that procedures used in shareholders' meetings must guarantee proper counting and registration of votes[172]. That is, computation of votes is transcendent. This provision is binding presently through the Shareholder Rights Directive II. These provisions are consistent with principle 6 of the Code of Good Governance of the Spanish Markets and Securities Commission (CNMV 2020), since it establishes that the General Shareholder's Meeting must operate under the transparency principle and with adequate information.

6. Concluding remarks

[167] In favour of omnibus accounts, it should be noted that they have made possible to reduce transaction costs by creating economies of scale and increasing liquidity and facilitating loans of marketable securities, although at the cost of reducing transparency, since the identity of the custodian bank is recorded instead of the ultimate beneficiary. HOBSON, Dominik, «The Future of the Omnibus Account» (2014), *Clearstream*, p. 2, available at https://www.clearstream.com/resource/blob/1312332/bc8ff5e084310b7a98ec5f39eff47c0a/hobsonseries14mgem-data.pdf

He alludes to the fact that the obvious solution for the stock market is to delete omnibus accounts and use accounts of the ultimate beneficiaries. However, some authors warn that this is inadequate because no beneficiary will be identified beyond the immediate to the main one and would be inefficient for the industry. Thanks to these omnibus accounts the market is more open to larger classes of investors.

[168] PANISI et al., «Blockchain and Public Companies…» *op.cit.*, p. 211.

[169] VAN DER ELST, Christoph, LAFARRE, Anne, «Blockchain technology for corporate governance and shareholder activism», *ECGI Working Paper (series Law)*, nº 390, March 22, 2018, pp. 1-26.

[170] *Cf.*, PEINADO GRACIA, Juan Ignacio, BEDNARZ, Zofia, «Cuestionando las bondades de la "blockchain" en las juntas generales. "un martillo buscando un clavo" », *Revista de Derecho de Sociedades,* No. 61, 2021, electronic version, Section I.1.

[171] Regulation (EU) 2022/858 of the European Parliament and of the Council of 30 May 2022, on a pilot regime for market infrastructures based on distributed ledger technology, and amending Regulations (EU) No 600/2014 and (EU) No. 600/2014 and (EU) No 909/2014 and Directive 2014/65/EU. TAPIA HERMIDA, Alberto Javier, «Los facilitadores de la innovación de las tecnofinanzas en la Unión Europea y en España en especial, los espacios controlados de pruebas o "sandboxes"», *Revista del Derecho de Mercado de Valores*, No. 29, 2021. In Spain, Law 7/2020 is relevant for the digital transformation of the financial system. For a discussion of the proposal, *see* GARCÍA MARTÍNEZ, Luz María, «Infraestructuras de mercado basadas en tecnología de registro distribuido (TRD): el futuro Régimen Piloto de la UE», *Revista de Derecho del Mercado de Valores,* No. 29, 2021.

[172] Section V.A.8 of the 2004 OECD Principles on Corporate Governance.

Blockchain represents an opportunity because an entire voting process in a listed company is in the hands of their shareholders. The voting process through blockchain is transparent, decentralized and in principle bottom-up. To conduct the right to vote with or without a central authority is a decision to take by the current bodies of the corporation.

Corporate law based on scraps as if it were a patchwork is not the most advisable because companies need flexibility. Delaware corporate law was described as an example of an innovate flexible model in relation to blockchain introduction in corporate law, which contrasts with the rigidity of Spanish current corporate law as the most advanced model of implementation of voting via blockchain is not possible. This advanced model also implies a change in capital markets structured. Under Spanish corporate law only a mixed model of blockchain vote can be implemented. The Iberdrola AGM in July 2022 is an example of the second type of mixed model explained in this article. However, in the European Union the Estonia's E-residency programme is highlighted because it implements a model to follow. It aims to ensure that shareholders participate in voting and company meetings in an easier and safer way for which regulation is essential. This Estonian model corresponds with the first type of mixed model explained in the article.

It is anticipated that electronic voting by blockchain can improve shareholder participation by being a more secure and efficient system, which will produce externalities in the future of society. An extension of the Estonian e-voting pilot programme to the rest of the EU would be a plausible and desirable effect provided that companies have it regulated in their by-laws or shareholders' meeting rules.

Additionally, voting via blockchain would also help to comply with the recent transposition of Directive (EU) 2017/828 on fostering long-term shareholder engagement. In this case, blockchain technology would align with efficiency, as it would be developed to complement national corporate law.

Finally, the Regulation (EU) 2022/858 of 30 May 2022 presents a chance to evaluate financial services in a new context, establishing a pilot regime for market infrastructures based on distributed ledger technology. This new piece of legislation should play a significant role in advancing the society knowledge of distributed ledger technology.

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