Bringing the AGM to the 21st Century: Blockchain and Smart Contracting Tech for Shareholder Involvement

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Blockchain and Smart Contracting Tech for Shareholder Involvement

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Abstract:

The AGM is often considered to play an important role in direct shareholder monitoring of directors and corporate blockholders. However, its practical functioning suffers from large obstacles. In this research we outline the AGM's flaws and argue that blockchain technology can bring this yearly classical gathering to the 21st century. Using a blockchain that records shareholder voting on a private ledger, shareholder decision-making can be faster and cheaper. Once a voting item is placed in the blockchain, shareholders are notified and can exercise their tokenized voting rights. When a majority is reached, the voting outcome becomes immutable and verifiable. This state-of-the-art decentralized form of 'meetings of and with shareholders' offers large advantages: faster decision-making in a decentral environment and substantially reduced voting and meeting organizing costs, which can enhance shareholders' willingness to participate.

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1. Introduction

The Annual General Meeting of shareholders (hereinafter: AGM) is a well-known yearly corporate event. Shareholders, directors and other corporate actors are already familiar with these classical annually gatherings for centuries. From a theoretical agency perspective, the meeting is an important corporate law solution for mitigating agency problems in the corporate setting that exist between shareholders and managers in large public corporations. As shareholder decision-making would be largely inefficient due to coordination and information failures, most powers to govern the company are usually vested in a board of directors that is periodically elected. However, fundamental changes of the corporation, like amendments of the articles of association and mergers also require the approval of the shareholders gathered together in the general meeting. This organizational feature is considered as one of the fundamental characteristic of corporations.[2]

Vesting the powers in the board of directors also shifts problems of conflicting goals and opportunistic behaviour in the relationships between small shareholders and controlling blockholders. The presence of blockholders can add agency costs due to an increased risk of private benefit extraction. Blockholders may have incentives to use their majority stake to maximize their private benefits instead of the total value for all shareholders. An example of opportunistic behaviour that is often mentioned by scholars is the situation where a large shareholder negotiates a cheap loan with the company with an interest rate below the market rate (also referred to as 'tunneling behaviour'). The smaller the *de facto* controlling stake of the blockholder is, the larger the benefits of opportunistic behaviour at the company's expense. Thus, minority shareholders would need to monitor the behaviour of the blockholders striving for their personal interests. The board of directors are guided by the interests of the company and the shift of powers from the shareholders also enables to counter or prevent the possible opportunistic behaviour of controlling blockholders.

Monitoring and fundamental decision-making is in the hands of the shareholders. The AGM is the only venue for *all* shareholders to directly monitor the directors and blockholders, and there is a large and ongoing debate on how to structure the AGM appropriately and how to involve shareholders accordingly. Recently, the European Commission confirmed its aim at increasing and enhancing shareholder rights and participation with its amendments to the

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[2] R. Kraakman e.a., *The Anatomy of Corporate Law* (Oxford: OUP 2017). pp. 11-13.

Shareholder Rights Directive.[3] The new Directive includes, *inter alia*, the requirement for institutional investors and asset managers to develop an engagement policy and, a shareholder say on pay and a say on large related party transactions.

Nonetheless, enhancing the decision-making rights does not address all important issues. The AGM is a very static body with a lot of rubber-stamping shareholders and often limited added value. In this contribution we argue that a decentralized system that makes use of blockchain solutions can strongly enhance the position of the AGM, adapting it to 21st century technology, and offering real solutions to the impediments of this 19th century static corporate organ. In the next section, we illustrate why the general meeting is, due its hardly modernized nature, unsuitable to serve the needs of shareholders and companies in the 21th century. In the third section we briefly present blockchain technology and smart contracts and in the fourth section we provide in a first assessment how 'legal tech' can be helpful in the modernization of the general meeting. The final section provides a conclusion and identifies areas for further research.

2. The Classical AGM and its Flaws

The classical AGM has three functions to shareholders: shareholders are informed (*information function*), they are offered a venue to discuss and ask questions (*forum function*), and they take decisions (*decision-making function*). The decision-making function of AGMs is often considered to be the core function of the AGM.[4] Nevertheless, all three functions are at least partially hollowed due to the modern technologies, other legal developments and evolving needs of all corporate incumbents. This resulted in other practices, including side-stepping behaviour of large and institutional shareholders that discuss matters with the corporate board during private meetings. In the meantime, the basics of the AGM remained unchanged. According to the UK Companies Act 2006, for any resolution that must be passed at a shareholders' meeting, section 301 requires a meeting to be held and conducted and a notice for this meeting. A public company must hold an AGM within six months of the end of an accounting period, making all officers

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[3] Directive (EU) 2017/828 of the European Parliament and of the Council of 17 May 2017 amending Directive 2007/36/EC as regards the encouragement of long-term shareholder engagement, *PB L* nr. 132, 20 May 2017.
[4] T. Strand, *The Owners and the Power: Insights from Annual General Meetings*, PhD series 25.2012 (Denmark: Copenhagen Business School 2012).

committing an offence for failing to do so.[5] During this meeting, the directors must lay a copy of the company's annual accounts and reports. According to the UK Corporate Governance Code, the election of the directors of FTSE-350 companies by the shareholders should be annually taken place, for the other directors at regular intervals.[6] The AGM appoints the directors individually.[7] Many of these UK Companies Act 2006 provisions are still equivalent to those that can be found in Table B of the UK Joint Stock Companies Act of 1856.[8] In Belgium, the AGM "listens to the annual report"[9] and approves the annual accounts after which it provides in the discharge of the directors and the external auditor, in accordance with current article 554 of the Belgian Companies Act. Like the UK situation, also these provisions are still identical to the ones in articles 60 to 64 of the Belgian Companies Act of 1872.[10]

2.1. Flawed Information Function

Most AGMs take place between three and six months after the end of an accounting period. However, the relevant information for shareholders and investors is not disclosed in the general meeting of shareholders, but *ad hoc*, at certain intervals throughout the year, and often long before the AGM takes place. First, several changes related to the company that take place during any time of the year need to be disclosed separately in the following days. This is for instance the case for the acquisition or disposal of major proportions of the voting rights[11]. In addition, the public must be informed "as soon as possible of inside information which directly concerns [the company]" [12]. Accordingly, many companies provide in extensive disclosure of the (unaudited)

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[5] Section 336 UK Companies Act 2006.
[6] Code Provision B.7.1. UK Corporate Governance Code.
[7] Section 160 UK Companies Act 2006.
[8] This Table can be accessed at <https://www.gov.uk/guidance/model-articles-of-association-for-limited-companies>, accessed in June 2017. See, for example, Article 70: "Once at the least in every year the directors shall lay before the company in general meeting a statement of the income and expenditure for the past year, made up to a date not more than three months before such meeting".
[9] The first line of article 554 states (in Dutch): "*De algemene vergadering hoort het jaarverslag en het verslag van de commissarissen en behandelt de jaarrekening*".
[10] J. Guillery, *Des Sociétés Commerciales en Belgique* (Brussels: Bruylant 1882).
[11] Article 12 *et seq.* of Directive 2004/109/EC of the European Parliament and of the Council of 15 December 2004 on the harmonisation of transparency requirements in relation to information about issuers whose securities are admitted to trading on a regulated market and amending Directive 2001/34/EC, *PB L* nr. 390 of 31 December 2004.
[12] Article 17 of Regulation (EU) No 596/2014 of the European Parliament and of the Council of 16 April 2014 on market abuse (market abuse regulation) and repealing Directive 2003/6/EC of the European

financial results of the company within weeks after the end of an accounting period providing in a detailed analysis of the past period and explaining how the near future will look like.[13] Second, companies must not only disclose lengthy annual reports and accounts but also a "half-yearly financial report covering the first six months of the financial year as soon as possible after the end of the relevant period, but at the latest three months thereafter"[14]. Finally, the information for the AGM must not be disclosed at the meeting itself, but weeks before the meeting takes place in order to provide shareholders sufficient time for preparing the other goals of the meeting, *i.e.* the forum and decision-making function. The convocation of the meeting not only needs to provide in a detailed agenda of the items to be discussed and voted, but also the draft resolutions and comments from the board.[15] The record date is a cut-off date that determines in the US whether the shareholder is eligible for a dividend but more importantly for this study, in many jurisdictions, it is used as the date of which the shareholders of the company will be entitled to receive notice of, and to vote at, the AGM. Table 1 provides an overview of the minimum notice period and record date requirements in several European Member States. It can be noted that the minimum notice period is relatively long in the Netherlands and France with 42 and 35 days respectively. In the other continental European Member States the minimum notice period is around 30 days. In contrast, in the UK and Ireland, the minimum notice period is shorter with 21 days for AGMs and, in case the requirements of the Shareholder Rights Directive are met, this period can be reduced to 14 days for GMs. Also the record date is relatively short in these European countries compared to the continental European Member States. The Netherlands has the longest period between the record date and the meeting, with 28 days. In this setting, shareholders should never be allocated powers that require a forthwith decision. The record date

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Parliament and of the Council and Commission Directives 2003/124/EC, 2003/125/EC and 2004/72/EC Text with EEA relevance, *PB L* nr. 173 of 12 June 2014.

[13] For a nice example, see the full year results disclosure announcement of Unilever on 26 January 2017. Available at:
<https://otp.tools.investis.com/clients/uk/unilever/rns1/regulatory-story.aspx?cid=129&newsid=839275>, accessed in June 2017. The annual financial report was disclosed over one month later, the announcement of the annual general meeting was announced early March 2017 and took place at the end of April 2017.

[14] Article 5 of Directive 2004/109/EC.

[15] Article 5(4)(d) of 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, *PB L* nr. 184 of 14 June 2007.

used to be only a technical limitation[16] that, as we will show, no longer should determine the division of powers between shareholders and the board of directors.

Table 1: Minimum notice period and record date

Country	Minimum notice period	Record date
Austria	28 days (or 21)	10 days
Belgium	30 days	14 days
France	35 days	3 business days
Germany	30 days	21 days
Ireland	21 days (or 14 for GMs if some requirements are met)	48 hours
Netherlands	42 days	28 days
UK	21 days (or 14 for GMs if some requirements are met)	48 hours
European requirement	at least 21 days (or 14 for GMs if some requirements are met)	30 days maximum

To conclude, due to market securities regulation, investor demands and shareholder protection, all information must be disclosed and is already disclosed before the AGM, except for the information that flows from the meeting itself, for instance the defeat of an agenda item.

2.2. Flawed Forum Function

While it can be argued that the forum function of the AGM is less corroded than the information function, the current importance of the section of question and discussion time during the AGM should not be overstated. First, while looking backwards for one accounting year and looking forward to the current year, general meetings last, "at best" some hours. There is only limited time available and in some countries the speaking time that each shareholder is provided, is restricted. The German Stock Corporation Act states that the company's articles of association may authorise the chairperson of the meeting to limit the number of questions and speaking time of shareholders as appropriate[17] and the German *Bundesgerichtshof* confirmed that a provision in the articles of association limiting the speaking and questioning time in order to end a regular general meeting within six hours is in accordance with the German Stock Corporation Act.[18] An individual speaking time limitation of ten minutes per shareholders and a total speaking time for

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[16] For a clear analysis see J. Winter, "Cross-border Voting in Europe", in *Capital Markets and Company Law*, 387-426 (K. Hopt and E. Wymeersch (eds.), Oxford, OUP, 2003).
[17] Section 132(2) German Stock Corporation Act.
[18] BGH (2010) Karl-Walter Freitag/Biotest AG-case, 8 February 2010, II ZR. 94/08.

all shareholders of forty-five minutes is considered reasonable.[19] In addition, the company can limit different kinds of questions when providing in a Q&A section, offering standard answers in accordance with article 9, §2 of the Shareholder Rights Directive stating that "an answer shall be deemed to be given if the relevant information is available on the company's Internet site in a question and answer format". It is only one example of the reduction of a multilateral debate between shareholders and board members to the one way dissemination function. There are other techniques available too. Many companies disseminate information through their websites, for instance webcasts and (presentations of) conferences and investor meetings. Moreover, the Shareholder Rights Directive also provides boards in a refusal right to discuss a topic if it aims for "the protection of confidentiality and business interests of companies"[20].

Research shows that many shareholders in controlled companies, small shareholders in particular, have limited to no needs for the AGMs forum function. Small voter turnout in continental Europe is often less than 50%[21] and sometimes even as low as 2%[22]. Further, a study found that in large sample of Dutch companies on average eight shareholders raised questions,[23] whilst listed companies with tens of thousands of shareholders are not uncommon.

2.3. Flawed Decision-Making Function

Even the AGMs most important function, the decision making function, is not free from a number of flaws. In the previous section we noted that the attendance of, in particular, small shareholders is low. Economic theory predicts that, in particular, small shareholders consider the costs of participating in the AGM too high and are reluctant to vote. In continental Europe, many companies usually also face higher ownership concentration, which means that large shareholders may have de jure or *de facto* control leading to opportunistic behaviour of small shareholders. The outcome of the vote will be the same regardless of whether a small individual shareholder participates or not. In other words, the marginal effect of a small shareholder's vote on the outcome will be insignificant. Rational shareholders weigh the marginal costs of voting against

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[19] *Ibid.*

[20] Article 9(2) of the Shareholder Rights Directive (2007/36/EC).

[21] A. Lafarre, *The AGM in Europe* (Tilburg: Tilburg University 2017).

[22] The minutes of the AGM of Care Property Invest shows that in 2016 only 1.84% of the shares were represented at the meeting. Available at:
<http://carepropertyinvest.be/wp-content/uploads/Notulen_AV20_AV20160518.pdf>, accessed in June 2017.

[23] Lafarre (2017).

the marginal benefits and invest the amount of effort for which these benefits exceed the costs. When the benefits of voting are small (approximately zero), and voting comes at a cost, no individual shareholder would be willing to incur this cost of voting; in this case, their optimal monitoring investment will be zero.[24] A second related economic problem is the free-rider problem as shareholder monitoring can be considered a public good. Due to the non-excludable and non-rival characteristics of shareholder monitoring, i.e. a shareholder cannot prevent other shareholders from benefiting from his monitoring efforts and consuming the benefits from monitoring does not affect the benefits for other shareholders, other shareholders are able to (partly) free-ride on the monitoring efforts of an individual shareholder and therefore, no individual shareholder would be willing to incur the (full) costs of monitoring if these are non-zero. This free-rider problem results in a sub-optimal amount of the public good; the actual monitoring level is lower than the monitoring level that maximizes the collective welfare of all (small) shareholders. Further, shareholders can express their discontentment with the corporate state of affairs by selling their shares and investing elsewhere (often referred to as the 'Wall Street Walk'[25]).

The costs of participating in the AGM is significantly lowered with the use of proxy voting, a form of voting whereby a shareholder delegates her voting power to a representative, and voting by mail. Whilst there are many different forms of proxy voting depending on how the voting power was delegated, shareholders generally send in a card to a proxy agent indicating how to vote the shares. It resembles voting by mail, in particular when the proxy agent receives specific instructions on how to vote and consequently cannot take the specificities of the meeting and its deliberative process − which could alter the opinion of the shareholder − into account. Voting by mail is generally the most common way of voicing the shareholder's opinion on an AGM agenda item. For instance, Table 2 provides insight in the shareholders' participating means of Atos Origin, a large French listed company in the digital services industry. The table shows that a large and increasing number of shareholders votes by mail or provides a proxy to the chairman. Only 1 percent to 5 percent of the shareholders attends the meeting in person.

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[24] F. Easterbrook & D. Fischel, *The Economic Structure of Corporate Law* (Cambridge, Massachusetts: Harvard University Press 1991).
[25] For example see A. Admati & P. Pfleiderer, *The "Wall Street Walk" and Shareholder Activism: Exit as a Form of Voice*, 22(7) The Review of Financial Studies, 2445-2486 (2009).

Table 2: Atos Origin: Participating Shareholders at Shareholder Meetings (2012-2016)

Use of shareholders' participation means (# of shareholders)						
Shareholders	2012	2013	2014	2015	2016	30-dec-16
Attending in person	43	8	43	47	47	27
represented	0	1	0	1	1	2
proxy to the chairman	71	53	60	448	448	629
votes by mail	701	567	657	1070	1070	1080
Total	815	629	760	1566	1566	1738
Use of shareholders' participation means (% of shareholders)						
Shareholders	2012	2013	2014	2015	2016	30-dec-16
attending in person	5,3%	1,3%	5,7%	3,0%	3,0%	1,6%
represented	0,0%	0,2%	0,0%	0,1%	0,1%	0,1%
proxy to the chairman	8,7%	8,4%	7,9%	28,6%	28,6%	36,2%
votes by mail	86,0%	90,1%	86,4%	68,3%	68,3%	62,1%
Total	100%	100%	100%	100%	100%	100%

Source: Minutes of the meetings of Atos Origin; own calculations

The importance of voting by mail is even more visible when the voting stakes are considered (Table 3). The number of votes from attending shareholders steadily diminished while the votes from shareholders voting by mail increased from 70 percent to more than 95 per cent of all votes. For another 3 percent of the votes the chairman of the board acts as a proxy holder. It illustrates that the voting results are known to the board of directors before the meeting even takes place: during the last meeting of December 30, 2016, the number of votes of the attending shareholders shrank to less than 1 percent. It can be questioned to what extent the decision taking function of the shareholders is taking place *at the meeting*.

The legislator mitigated the downside of the slow, yearly pace at which the shareholders can participate in the decision-making process with EGMs, which are Extraordinary General Meetings. Boards of directors can call these extra meetings whenever the companies' business requires the involvement of the shareholders, like for a capital increase, any decision that cannot be postponed to the next AGM or when significant shareholders order the board to call the EGM.

Table 3: Atos Origin: Shares voted at Shareholder Meetings (2012-2016)

Use of shareholders' participation means (# of votes)						
Votes	**2012**	**2013**	**2014**	**2015**	**2016**	**30-dec-16**
attending in person	17,893,710	9,432,333	10,211,936	862,227	862,227	666,564
represented	0	5	0	171	171	67
proxy to the chairman	659,158	125,551	102,246	2,282,965	2,282,965	2,167,887
votes by mail	45,098,685	56,626,637	56,735,931	59,667,583	59,667,583	67,431,532
Total	63,651,553	66,184,526	67,050,113	62,812,946	62,812,946	70,266,050
Use of shareholders' participation means (% of votes)						
Votes	**2012**	**2013**	**2014**	**2015**	**2016**	**30-dec-16**
attending in person	28,1%	14,3%	15,2%	1,4%	1,4%	0,9%
represented	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
proxy to the chairman	1,0%	0,2%	0,2%	3,6%	3,6%	3,1%
votes by mail	70,9%	85,6%	84,6%	95,0%	95,0%	96,0%
Total	100%	100%	100%	100%	100%	100%

Source: Minutes of the meetings of Atos Origin; own calculations

These extra meetings are expensive processes with lengthy preparatory reports, specific quorum demands resulting in recurrent convocations to pass the quorum thresholds, often requiring the involvement of external parties like notaries and lengthy procedures. These EGMs require, at the very least, a notice period of 14 days, in accordance with a special provision in the Shareholder Rights Directive (Directive 2007/36/EC, also see Table 1),[26] which was implemented in the national laws of the UK and Ireland, and, with longer notice periods, in (most) continental Member States. Hence, even when companies decide to convene an EGM to let shareholders decide on a particular resolution before the AGM takes place, these terms prohibit companies from acting really fast. Companies try to optimize the process and make it cost-efficient in combining the AGM and the EGM, which is common practice in Belgium and France, but then actually need to return to the slow yearly pace of the decision process. Contrary, when companies

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[26] Article 5 of the Shareholder Rights Directive (2007/36/EC) requires Member States to ensure that the convocation of the general meeting is issued at least 21 days before the meeting. Member States may provide the possibility of a reduction to 14 days in the case of a general meeting (which is not an AGM), where the company makes voting by electronic means accessible to all shareholders. Such a resolution needs a qualified majority of at least two thirds of the votes. This authority only holds until the next annual general meeting at the latest. Pursuant to article 5(4) of the Shareholder Rights Directive, Member States need to ensure that the convocation of the general meeting, the total number of shares and voting rights at the date of the convocation, the documents to be submitted to the general meeting, a draft resolution and the forms to be used to vote by proxy and correspondence be published on the company's website for a continuous period that starts at least 21 days before the general meeting. Article 5(3) stipulates the minimum content of the convocation of the meeting.

run into difficulties, sometimes many meetings must be organized throughout an accounting period. Nyrstar, a leading Belgian zinc and lead smelting company, organised between December 2015 and May 2017 not less than nine EGMs. With attendance rates varying between 2.4 and 37 percent, each EGM had to be called a second time because the quorum was not reached at the first EGM. Finally, at the EGM of May 2017 where only 2.4 percent of the shares was represented, the 'Deed of Guarantee' was unanimous approved (note that no quorum is required at the second EGM in accordance with article 558 Belgian Companies Act).

As many legislators recognize that this EGM-tool is not efficient, many countries empowered the boards of directors to take a decision as if they are the shareholders for the intermediary period between two AGMs. This is the case for the co-optation of directors, which is in effect a deviation of one of the most fundamental shareholder rights. If a director resigns, her position can be taken by another director, co-opted by the board. The next general meeting of shareholders must approve the election of the co-opted director. This practice is common in Belgium and requires that the next general meeting provides in the "final appointment"[27]. It is even found that the co-opted directors resigned from office before the AGM confirmed her appointment[28], which illustrates the case that the decision taking function of the AGM is not absolute, not even for the appointment of directors.

As a result of all these obstacles, the AGM cannot perform optimally in its current form. In the following sections we explore the characteristics of blockchain technology and smart contracting to see whether these state-of-the-art technologies can bring the current system of AGMs to the 21st century. Like Atzori (2015) claims in the political context, blockchain technology can offer a decentralized and efficient alternative for the traditional, centralized and static AGM in corporate governance.[29]

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[27] Article 519 Belgian Companies Act. If the AGM does not appoint the co-opted director, her mandate ends.

[28] This was the case at Ontex, a Belgian hygienic products supplier, when the board co-opted two directors in August and September 2014 which already resigned in March and April 2015, before the AGM took place.

[29] M. Atzori, *Blockchain Technology and Decentralized Governance: Is the State Still Necessary?* (2015). Available via SSRN.

3. Blockchain and Smart Contracts

The notion 'blockchain' often pops up in the media nowadays and is either seen as a hype or as a disruptive technology, but what does it entail?[30] In short, "blockchain is an open, distributed ledger that can record transactions between parties efficiently and in a verifiable and permanent way"[31]. A ledger can be considered a book or a collection of financial accounts and most likely its origin dates back from the day people started to trade and needed to keep records. In a blockchain system, the ledger usually is public (also called: 'unpermissioned') and contains all transactions that are executed. Its transparency makes it different from the conventional ledgers which are held centrally, in the infrastructure of a single organization, like the accounts of all customers of a bank, or any other trusted central party. Since the number of transactions is always increasing, blocks with these transactions are continuously added to the ledger. Contrary to a classical ledger whereby a previous record is being overwritten, each new transaction is added in the blockchain system. These blocks are added in a linear and chronological way, hence the term 'blockchain'. The ledger is replicated in many identical decentral databases that are simultaneously updated when changes are made to one of them. It is collectively maintained by all the participants. Once a block is completed, it is immutable and goes permanently into the ledger, thus verifying the transactions. Hence, there is no need for a third-party intermediary for verification. In absence of a trusted intermediary, the validation of a transaction relies on a process for achieving consensus among all the participating parties or nodes. It includes a validation aspect of every transaction to ensure its legitimacy and a broadcasting process of the new block, adding it to the ledger. Thereto, each block contains a record of the previous block header to ensure the immutability of each transaction. In this way the blocks are chained together and as a result, in order to change a transaction, one not only has to modify the concerned block, but also all following blocks.[32]

The system is operating on a decentralized peer-to-peer network. Achieving consensus is resource intensive, in particular in an 'open' form blockchain whereby everybody can contribute and no one can claim control. This so called 'unpermissioned ledger' requires the nodes to

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[30] See for a recent, condense overview R. O'Shields, *Smart Contracts: Legal Agreements for the Blockchain*, 21 North Carolina Banking Institute, 177-194 (2017).

[31] M. Lansiti & K. Lakhani, *The Truth About Blockchain*, January–February 2017 *issue* Harvard Business Review, 118–127 (2017).

[32] Bitcoin.org Bitcoin Developer Guide. Available at: <https://bitcoin.org/en/developer-guide#block-chain-overview>, accessed in June 2017.

investigate whether the transaction can be validated, the so called 'mining'.[33] This process requires the use of significant resources to perform all the calculations to solve the algorithm problem. Parties need an incentive to have a new block added to the ledger, which is, for instance in the case of Bitcoin incentivized through the granting of a certain number of Bitcoins. Blockchain was first introduced by Bitcoin as a decentralized network for its digital currency in October 2008.[34] Bitcoin is the first application of blockchain technology, in an unpermissioned ledger form, but since its introduction more and more applications are developed. The blockchain can also be established in a 'permissioned' ledger or 'private' ledger, controlled by a central organization or by a group of participants. This type of ledger supports record systems that keep track of specific documents, transactions, status of settlements and even votes and shares of companies. So far, each block is identified as some kind of a transaction, but it can be broadened to other applications, including so called 'smart contracts' and voting.

Smart contracts are an example of well-known applications of blockchain technology today. The term 'smart contract' was first introduced in the 90s by Nick Szabo.[35] These contracts monitor the negotiated conditions and automate payments as soon as these conditions are met. A smart contract can be considered a syntax that is capable of entering, executing and enforcing (some or all terms of) an agreement using blockchain technology. One can think of an example whereby a consumer is accessing a streaming service that is triggering the right of the service provider to be funded from the bank of the consumer a certain amount of money. Upfront the parties enter into a contract including the services, currency, etc., and the events that trigger contract execution − in our example: accessing the streaming service − initiate the movement of value based on the settled conditions. Lansiti and Lakhani provide an example of a smart contract that can send a payment to the supplier as soon as a shipment is delivered. The receiving party can signal via blockchain that the goods are delivered, or these goods can have a GPS tracking. Legal provisions are replaced by syntax in a smart contract that is executed in a blockchain. Since the terms and conditions are recorded in the blockchain, they cannot be amended anymore, which removes the uncertainty of the possibility that one of the party wants to renegotiate the contract.

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[33] B. Akins, J. Chapman & J. Gordon, *The Case for the Regulation of Bitcoin Mining as a Security*, 19(3) Virginia Journal of Law and Technology, 669-715 (2015).
[34] Lansiti & Lakhani (2017).
[35] E. Tjong Tjin Tai, *Smart Contracts en het Recht*, 2017/46 Nederlands Juristenblad (2017).

All conditions are included in the smart contract, and actions are automated as soon as these conditions are met, which decreases transaction costs substantially. Everest Group, a management consulting and research firm, identified many applications for smart contracts: trade finance, P2P insurance, loyalty and rewards, digital rights management and micropayments, land registry, securities issuance, syndicated loans, event-driven insurance, post-trade services and distributed smart power grid.[36]

There are several platforms that facilitate smart contracting. The most well-known is Ethereum, "a decentralized platform that runs smart contracts"[37], which in essence is an improvement of Bitcoin.[38] The Ethereum Foundation, a Swiss non-profit organization,[39] developed Ethereum and its digital currency 'ether' based on a whitepaper written by its founder, Vitalik Buterin.[40] According to Buterin,contracts in Ethereum are "like a sort of autonomous agent simulated by the blockchain. Each Ethereum contract has its own internal scripting code, and the scripting code is activated every time a transaction is sent to it. The scripting language has access to the transaction's value, sender and optional data fields, as well some block data and its own internal memory, as inputs, and can send transactions"[41]. Users of Ethereum can create their own operations and can run applications as programmed, smart contract coding.

4. Legal Tech for Shareholders and AGMs

Blockchain technology may offer opportunities for investors, shareholders and the current platform through which shareholders currently engage with the company, general meetings. In the previous section we established that blockchain allows for a large number of unknown parties to engage in transactions that are recorded on a public ledger. Especially in listed companies, ownership structures can be very widely-dispersed and shareholders often do not know each other. Also the company usually does not know its entire shareholder base that, in addition, can

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[36] Everest Group, *Smart Contracts on Distributed Ledger – Life in the Smart Lane* (2016). Available at: <http://www2.everestgrp.com/Files/previews/Smart%20Contracts%20on%20Distributed%20Ledger%20-%20Life%20in%20the%20Smart%20Lane.pdf>, accessed in June 2017.

[37] See <https://www.ethereum.org/>, accessed in June 2017.

[38] Tjong Tjin Tai (2017).

[39] See < https://www.ethereum.org/foundation>, accessed in June 2017.

[40] See for example V. Buterin, Ethereum: A Next-Generation Cryptocurrency and Decentralized Application Platform (2014). Available at: < https://bitcoinmagazine.com/articles/ethereum-next-generation-cryptocurrency-decentralized-application-platform-1390528211/>, accessed in June 2017.

[41] Buterin (2014).

change substantially at a daily basis due to the transferability of shares in the stock exchange markets. Using a blockchain that records shareholder transactions as well as decision-making on a private ledger, for example as outlined in the CSD Working Group on DLT or carried out in Nasdaq's Estonian pilot (*cf. infra*, section 4.2), the main impediments and shortcomings to shareholder decision-making in its current form can be solved. Before outlining the features of this system in section 4.3, we first briefly consider the existing blockchain initiatives for issuing shares in section 4.1, and shareholder voting applications in section 4.2.

4.1. Blockchain and Issuing and Trading Shares

Blockchain and smart contracts can be of use for many other applications, including the issuance of securities. A company can issue digital securities that exist only by entry in a publicly distributed ledger and the securities can be transferred through that ledger. The transactions and the ownership of the assets, which can be shares, bonds, or any other type of securities, can be executed and confirmed in the blockchain. Contrary to the belief of many, as bitcoins are associated with anonymous transactions, the use of blockchain can increase transparency of securities ownership and transactions. Intermediaries, like brokers, become superfluous and real-time transactions become the standard. As positions in securities become visible to all, mandatory filing in the next days (or sometimes weeks) are no longer necessary.[42] Overstock.com, an American internet retailer, was the first company to make use of the issuance of preferred stock on a public ledger in December 2016 (the so-called 'tØ platform'[43]). It raised $10.9m of which $1.9m via the tØ platform. Since the settlement of the shares and the trading of shares occurs almost instantly, the platform's name is tØ, instead of the three days, t+3 in the current settlement procedure.[44] It is said that the 'digital share' has the same rights and preferences as the traditional shares of the same class.[45]

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[42] A substantial shareholder must notify the issuer within four trading days after which the shareholder acquired or disposed of a notifiable stake (following article 12(2) of Directive 2004/109/EC).

[43] Overstock.com, *Overstock.com Announces Rights Offering Including Blockchain Shares on t0 Platform*, Press release, 25 October 2016 (2016a). Available at:
<http://investors.overstock.com/mobile.view?c=131091&v=203&d=1&id=2215653>, accessed in June 2017. Also see: Overstock.com, *t0 platform successfully employed in the world's first public issuance of a blockchain equity*, Press release, 22 December 2016 (2016b). Available at:
<http://investors.overstock.com/mobile.view?c=131091&v=203&d=1&id=2231332>, accessed in June 2017.

[44] Overstock.com (2016b).

[45] Overstock.com (2016a).

Blockchain technology developments in the financial markets, also denoted with the popular term 'fintech', are not only an American phenomenon, however. For example, in Europe, the German Central Bank together with the Deutsche Börse announced in November 2016 the development of a prototype of blockchain technology to settle securities.[46] The parties claim that the developed blockchain-based technology can provide i) blockchain-based payments and securities transfers and settlement of securities transactions against both instant and delayed payment; ii) maintenance of confidentiality and access rights in blockchain-based concepts; iii) observance of regulatory requirements; iv) identification of potential to simplify reconciliation processes and regulatory reporting, and v) implementation of a concept based on a blockchain from Hyperledger[47].[48]

In short, the aforementioned examples show that both the issuance and the trading of shares can be facilitated with blockchain.

4.2. Shareholder e-Voting

Blockchain can also be used for voting. Not only in shareholder voting, but also in political elections turnout rates can be low. Economic theory even predicts that, just like small shareholders, no citizen would exercise its voting rights in political elections, since the marginal effect of their vote is approximately zero while incurring voting costs. Electronic voting may decrease the voting costs for people in political elections, and hence, increase turnout rates. Blockchain not only lowers the costs but is a secure alternative for the current voting process. The Danish political party 'The Liberal Alliance' used this technology to secure its e-voting in its 2014 annual meeting.[49] Another example is Estonia, which is currently the only country that has a fully digital government that allows citizens to cast their ballots online in Estonian political

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[46] Deutsche Bundesbank, *Joint Deutsche Bundesbank and Deutsche Börse blockchain prototype*, Press release of 28 November 2016 (2016). Available at:
<https://www.bundesbank.de/Redaktion/EN/Pressemitteilungen/BBK/2016/2016_11_28_blockchain_prot otype.html>, accessed in June 2017.
[47] According to <www.hyperledger.org>, "Hyperledger is an open source collaboration effort created to advance cross-industry blockchain technologies". More information: <www.hyperledger.org>, accessed in June 2017.
[48] Deutsche Bundesbank (2016).
[49] See Due.com, *6 Blockchain Applications That Go Beyond Bitcoin*, 1 December 2016 (2016). Available via: <http://www.nasdaq.com/article/6-blockchain-applications-that-go-beyond-bitcoin-cm716269>, accessed in June 2017.

elections.[50] The Cyber Security Case Study of Kaspersky Lab in cooperation with The Economist (2016) shows the relevance of blockchain applications for digital voting systems.[51] University teams from all over the world were invited to participate in this challenge to design a blockchain-compliant system for digital voting that addresses important security challenges, including i) privacy and the ability to check votes; ii) voting under duress; iii) (no) availability of interim results; iv) undecideds (i.e., blank votes and abstentions), and; v) voting aftermath (i.e., the possibility of contesting the election). The winning team from NYU developed Votebook,[52] which uses a private blockchain (which they called a "permissioned blockchain", p.3 of their proposal)[53] and does not allow for remote participation, but instead makes use of secured voting machines at public locations. The Nasdaq pilot of e-voting in Estonian 2016 AGMs was the first to apply blockchain technology to corporate voting. In February 2016, Nasdaq announced, in cooperation with the fully digital Estonian government, this blockchain based e-voting application that allows shareholders that hold shares in companies listed on the Tallinn Stock Exchange to vote remotely in AGMs.[54] Note that with this option to remotely participate in AGMs using blockchain technology, the Estonian-Nasdaq pilot goes one step further than

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[50] See: <https://e-estonia.com>, accessed in June, 2017). In addition, the e-residency program allows people from other countries to setup (location independent) companies online. For more information: <https://e-resident.gov.ee/>, accessed in June 2017. Also see N. Byrnes, *This Tiny Country Thinks Virtual Citizens Will Make It Rich*, 27 July 2016 MIT Technology Review, (2016). Available at: < https://www.technologyreview.com/s/601998/this-tiny-country-thinks-virtual-citizens-will-make-it-rich/>, accessed in June 2017.

[51] The Economist, Cyber Security Case Study Competition 2016, Kaspersky Lab Cyber Security Case Study (2016). Available at: <http://www.economist.com/whichmba/mba-case-studies/cyber-security-case-study-competition-2016>, accessed in June 2017.

[52] K. Kirby, A. Masi, F. Maymi, *Votebook A proposal for a blockchain-based electronic voting system*, (New York: New York University 2016). Available at: <https://www.economist.com/sites/default/files/nyu.pdf>, accessed in June 2017.

[53] Regarding private blockchains, Buterin writes on the Ethereum blog that "essentially, instead of having a fully public and uncontrolled network and state machine secured by cryptoeconomics […], it is also possible to create a system where access permissions are more tightly controlled, with rights to modify or even read the blockchain state restricted to a few users, while still maintaining many kinds of partial guarantees of authenticity and decentralization that blockchains provide". V. Buterin, *On Public and Private Blockchains*, 7 August 2015 (2015). Available at: https://blog.ethereum.org/2015/08/07/on-public-and-private-blockchains/, accessed in June 2017.

[54] R. Demarinis, *Is Blockchain the Answer to E-Voting? Nasdaq Believes so*. 23 January 2017 (2017). Available at: <http://business.nasdaq.com/marketinsite/2017/Is-Blockchain-the-Answer-to-E-voting-Nasdaq-Believes-So.html>, accessed in June 2017. Also see: Nasdaq, *Nasdaq's Blockchain Technology to Transform the Republic of Estonia's E-Residency Shareholder Participation*, News Release of 12 February 2016 (2016). Available at: <http://ir.nasdaq.com/releasedetail.cfm?releaseid=954654>, accessed in June 2017.

Votebook. In this pilot, blockchain was used to record shareholdings and shareholders received voting right assets and voting token assets in accordance with their holdings. The latter they could spend to cast their votes on each agenda item, but only when they also owned the voting right asset.[55] The pilot highly relied on the Estonian e-residency program. For example, secure remote identification was possible using the secure digital IDs.[56]

One of the latest developments in the field of corporate voting are the proposals for proxy voting of the CSD Working Group on DLT (Distributed Ledger Technology), which is a Consortium of Central Securities Depositories (NSD in Russia, Strate in South Africa, Six Securities Services in Switserland, Nasdaq Nordic, and DCV in Chile; hereinafter: Consortium).[57] The research report indicates that shareholder voting encounters some difficulties including the correct issuance and delivery of voting rights, the authentication of shareholders and authorized proxies, and the counting and reporting of voting results. The Consortium states that 'the most prominent problems today are complexity of the processes involved in the voting and lack of finality' (p.5). In the Consortium's opinion, blockchain technology can offer an 'easy accessible and reliable voting process' (p.5) that encourages minority and foreign shareholders to participate in AGMs. The research report addresses the flaws of the current voting systems in order to provide requirements for an AGM e-proxy voting system. For this, the Consortium identified the following steps:

Table 4: Proposed Process Flow of the CSD Working Group on DLT

#	Step	Description
1	Meeting Initialization	Setting the meeting date and record date on the distributed ledger.
2	Meeting Notification	The meeting's agenda and supplementary materials can be stored on the distributed ledger. Shareholders receive notifications (may be implemented outside the blockchain to reach out to potential voters).
3	Ownership Record Loading	Loading list of owners and ownership records at the voting record date into the blockchain. This provides shareholders with access to the meeting's agenda and other materials. Intermediaries in the custody chain load a list of beneficial owners to the distributed ledger, depending on the structure of the chain and national requirements.
4	Voting Right Allocation	Shareholders may choose whether they want to participate in the voting

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[55] Demarinis (2017) .

[56] Besides, the e-voting pilot was not the first engagement of Nasdaq in blockchain technology; on 30 December, 2015 it announced that its Linq blockchain technology was successfully used to complete and record a private securities transaction by Chain.com.

[57] CSD Working Group on DLT, *General Meeting Proxy Voting on Distributed Ledger Product Requirements v1.2*, (2016). Available at the websites of the CSDs, for instance <https://www.nsd.ru/en/press/ndcnews/index.php?id36=633471>, accessed in June 2017.

		process and different mechanisms are proposed (for instance, participation by default with voluntary opt-out or mandatory opt-in registration). Issuing of tokenized voting rights to all shareholders who are eligible for voting at the record date, taking into account voting restrictions, share types with different voting rights, etc. The system needs to supports the harmonization of records between all intermediaries and the issuer and uses a single source for determining the amount of voting rights.
5	Voting Party Authentication	Authentication of shareholders via one of the means supported by the local system, for instance an online identification system, or in case of Estonia, the e-residency program, which can take place outside the blockchain. The proof of authentication must be stored on the blockchain, but personal data may not be stored on the blockchain in line with local privacy requirements.
6	Proxy Assignment	Possibility to transfer of voting rights from the shareholder to the assigned proxy holder.
7	Voting	Issuing voting instructions by shareholders or proxy holders, using their tokenized voting rights. Voting can take place during the meeting time itself, any time between the record date and the end of the meeting, or, in line with legal requirements, perhaps before the record date.
8	Meeting Management	Shareholders must be able to see that their voting instructions are included in the voting outcome and actions should be traceable to their origin. Closing the meeting, either automatically or by the issuer must prevent further instructions to be issued and shareholders need to be able to calculate the voting outcome after this cut-off point. Other facilities including live streaming of the meeting and chat application can be provided.
9	Post-meeting actions	Any events that happen after the meeting independently of the rest, for example the access for auditors and regulators to review the data. Anonymity of the beneficial owners and confidentiality of their actions should be guaranteed when voting results are published.

Source: Adapted from the table on p.9 of the CSD Working Group on DLT report, using information from pp. 9-16 of this report.

In April 2017, Broadridge, a large proxy voting business, pioneered with the proxy voting progress process in cooperation with J.P.Morgan, Santander Investment and Northern Trust. Information on how the process was organized is scarce but it was announced to have been successfully run in the shadow of an AGM: "The pilot was run in support of a corporate issuer's annual general meeting (AGM) and included participation of Santander Investment, the issuer's agent. The pilot was run in parallel of the AGM, with the blockchain being utilized to produce a 'shadow' digital register of the proxy voting taking place in the traditional model."[58] It shows that

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[58] Broadridge Financial Solutions, Inc., *Broadridge, J.P. Morgan, Northern Trust and Banco Santander Successfully Complete Pilot of Blockchain-Based Proxy Vote Solution*, 11 April 2017 (2017). Available at: <http://www.prnewswire.com/news-releases/broadridge-jp-morgan-northern-trust-and-banco-santander-

intermediaries are investing and investigating the possibilities of using blockchain. However, we question whether the use of intermediaries denies part of the blockchain technology, i.e. whether the involvement of intermediaries is still needed.

4.3. Blockchain and AGMs

When both share trading and voting can be executed with blockchain, it brings us to a follow up question: should this technology support the AGM or can it even replace the (functions of the) AGM? The current legal framework is sufficiently flexible for introducing blockchain in the AGM. The Shareholder Rights Directive already facilitates some form of electronic voting. Article 8(1) of the Directive stipulates that Member States shall permit companies to offer to their shareholders any form of participation in the general meeting by electronic means, notably any or all of the following forms of participation: (a) real-time transmission of the general meeting; (b) real-time two-way communication enabling shareholders to address the general meeting from a remote location; (c) a mechanism for casting votes, whether before or during the general meeting, without the need to appoint a proxy holder who is physically present at the meeting. Paragraph 2 of article 8 adds that electronic participation may only be made subject to requirements when those are necessary to ensure the identification of shareholders and the security of electronic participation. This paragraph also adds that these requirements need to be proportionate to their purposes. As we have seen, blockchain is without a doubt a technology that can facilitate identification of shareholders and secure electronic participation. In addition, articles 10 and 11 of the Shareholder Rights Directive provide shareholders with the right to appoint a proxy holder to attend the AGM (or other general meeting), also by electronic means. This proxy holder, who votes in the shareholder's name, can be a natural person or a legal person. This person may not only vote, but also enjoys the same rights as the shareholder such as the right to ask questions and engage in discussions. As a result of these provisions in the Shareholder Rights Directive, all Member States offer some form of electronic participation in general meetings. Here too, blockchain can be used to further structure the relationship between the proxy holder and the shareholder.

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successfully-complete-pilot-of-blockchain-based-proxy-vote-solution-300437857.html>, accessed in June 2017.

It is often stated that the virtual shareholder meeting goes one step further than electronic participation.[59] This virtual meeting replaces the physical AGM completely; the entire meeting is conducted solely online.[60] As far as we are aware of, most Member States do not offer the possibility to replace the physical AGM by a virtual one. In the German Companies Act it is stated that the articles may provide, or may authorize the management board to provide, that the shareholders may participate in the shareholders' meeting without being present on site from which it follows that the meeting must take place 'on site'. [61] The Belgian Companies Code requires the company to organize an AGM in the municipality (in Dutch: "*in de gemeente*") provided in the articles of association.[62] A similar provision can be found in the Dutch Civil Code.[63]

The proposed process flow of the Consortium shows that blockchain technology offers large benefits for the classical AGM in terms of clarity of the voting process to shareholders, lowering voting costs and secured authentication and the counting of votes, which is likely to substantially increase shareholder turnout. However, we are of the opinion that the blockchain technology offers more opportunities for modernization and optimization. As we have outlined in section 2, not only low turnout rates are causing problems, but also delayed information and decision-making.

First, it is possible that stock transactions in public market are also carried in a blockchain (see the example of Overstock, *cf. supra.* section 4.1), thereby offering much more transparency and opportunities to control for short selling and empty voting at AGMs. For example, the issuer or intermediaries can monitor the conditions of the deal and can verify whether the ownership of the stock has been transferred in a few seconds in a (private) blockchain. Everybody should be able to engage in stock transactions in the blockchain and the blockchain should automatically record the share ownership at any moment in time. It can be noted that the subsequent thresholds set in the Transparency Directive (2004/109/EC) and in the national laws of the Member States will become redundant with blockchain technology in public stock markets, as exact share ownership is known at any time. Since only the disclosure of major holdings is required, the

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[59] E. Boros, *Virtual Shareholder Meetings*, 3 Duke Law & Technology Review, 1-10 (2004).
[60] A. van der Krans, *De virtuele aandeelhoudersvergadering,* Utrecht University (Deventer, The Netherlands: Kluwer 2009).
[61] § 118 (1) German Stock Corporation Act.
[62] Article 552 Belgian Companies Code.
[63] Book 2: 116 Dutch Civil Code.

shareholdings of shareholders that have shares or voting rights below the lowest required disclosure threshold in a particular jurisdiction should not (necessarily) be visible in the blockchain.

Second, following step 3 as explained by the Consortium (*cf. supra*, section 4.2), shareholders have access to information regarding their own ownership stake and the ownership stakes of other shareholders that need to disclose their shareholdings following the requirements in the national laws, for example resulting from the Transparency Directive. Similar to the proposed process of the Consortium, there is a private blockchain which is managed by the company (the issuer) and where only the shareholders that own shares in the company at the moment of a certain proposal needs to be decided on, have access to. Companies can place proposals in this private blockchain, just like shareholders or a group of shareholders that hold sufficient shares in the company in accordance with the legal requirements. Smart contracting allows structuring the private ledger with nodes that can for instance add, modify and implement certain (procedural) conditions such as the provisions that are provided in the articles of association, according to which the company, the shareholders and even proxy holders can be provided with different access rights. All information that is contained in the articles of association and in the law, for instance regarding majority thresholds and the minimum stake that is needed to bring forward a shareholder proposal, are contained in the blockchain.

Once a proposal, either a management or a shareholder proposal, is placed in the blockchain, shareholders that hold shares in the company are notified and can exercise their voting rights during a short period, for instance fourteen days in accordance with the shortest notice period provided for in the European rules for GMs not being an AGM. A date similar to a record date as a cut-off point for the amount of voting rights can be used in accordance with step 4 in the Consortium's report. Once the voting period is terminated, the proposal enters in the blockchain as a block and the voting outcome becomes immutable. We would even suggest to modify the law and facilitate shorter than 14-days periods. As we have seen, a large majority of the shareholders vote by mail. With blockchain technology, the voting results can become available instantly and majority requirements, making the decision binding and immutable, can be reached long before a 14-day period is reached.

Third, one may note that, although the Estonian pilot of Nasdaq, the pilot of Broadridge and the proposed blockchain technology by the Consortium are very relevant in the development

of a decentralized environment for AGMs, both initiatives still start from the premise of the AGM as a *yearly* event. Hence, their approach does not solve the important flaws that we outlined in the previous sections, such as for instance the problem of delayed information and decision-making. In contrast, we propose that *decentralized shareholder decision-making* does not only refer to a *decentralized system* in terms of a blockchain network environment, but also in respect to *setting aside the centralized yearly nature of the current AGM*. As outlined above, we propose that corporate decisions that require shareholder approval can be placed at any moment in the blockchain at a significantly lower cost than organizing an EGM. A co-optation right for the board of directors is no longer necessary. When a new director needs to be elected, a blockchain election process can be started.

Fourth, when discussing the theoretical role of the AGM in corporate law, we also mentioned its forum function. It should be noted that, with the introduction of blockchain technology, the forum function is likely to change. The blockchain can offer a discussion platform for shareholders and board members, but this platform will remain digital, for example in the form of a chat as proposed by the Consortium. The merits of face-to-face discussions and *ad hoc* questions may therefore disappear in our proposed outline of the AGM. However, many larger shareholders make use of the opportunity to engage with board members in private meetings. In addition, our example of Atos Origin shows that only few shareholders physically attend the AGM. Previous research shows that even fewer shareholders ask questions or have remarks. The main question then becomes whether we should keep our AGMs in their classical, cost-ineffective format, just for these few active participants? We would argue that this would not be very wise, also Q&A sessions can become part in the blockchain system but, we strongly recommend further research.

These measures will provide in substantial benefits which we outline below in two categories; i) fast decision-making in a decentral environment, and; ii) low costs and high turnout rates.

I. Fast Decision-Making in a Decentral Environment

In the first section we discussed the obstacles AGMs face. We have seen that shareholder decision-making in AGMs is often too slow and, as a result, can be useless, such as in the case of co-optation. The other option, calling an EGM to get the timely approval of shareholders for a

single resolution, is extremely costly and time-consuming. In addition, in case companies decide to convene an EGM, the notice periods and record dates still prohibit companies from acting really fast. This means that companies currently face a trade-off between delayed decision-making in the AGM and calling an expensive EGM that is also not *that* fast because of existing regulation. A blockchain application can take away this inefficiency and makes it possible to submit proposals, either management or shareholder proposals, directly to the shareholders, thereby removing its static annual nature. As proposed, shareholders may use their tokenized voting rights during a relatively short period, eventually depending on the decision that needs to be made. This would substantially improve the currently inefficient EGM-tool. It may be optimal to bundle certain decisions that are legally required to be put to a shareholders' vote on a yearly basis but for which there is no (high) need for acting fast. In this case, the classical AGM would still exist, but in a cost-efficient way. Note that without yearly, or periodically, bundling of voting items, we can hardly speak of an 'AGM' anymore.

II. Low Costs and High Turnout Rates

Blockchain technology substantially decreases the costs of shareholder decision-making, both for companies and shareholders. First of all, it may be clear that faster decision-making would cut costs to companies. Moreover, companies do not have to organize an expensive classical AGM every year. Next, also in line with the arguments of the Consortium, blockchain technology also reduces the costs of voting for shareholders; shareholders can vote during a short period on one or more voting items from their own desks and do not have to fill out any registration or proxy form anymore. Empirical research has shown that reducing the turnout costs for small shareholders increases their participation at AGMs.[64] This finding is in line with political voting theory. For example, Aldrich (1993) suggests that the turnout decision in political elections is made at the margin, which means that a small decrease in voting costs can increase political turnout rates substantially.[65] Since blockchain offers a reliable and accessible way of participation to (small) shareholders, thereby reducing the costs of participation, it is likely to stimulate (small) shareholder involvement in corporate decision-making.

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[64] Lafarre (2017).

[65] J. Aldrich, *Rational Choice and Turnout*, 37(1) American Journal of Political Science, 246-278 (1993).

5. Concluding remarks

In the previous sections we have outlined some, at least in our opinion, convincing arguments that the application of blockchain technology offers huge benefits to modernize the shareholder relationships with the company and thus corporate decision-making. Hence, it offers opportunities for a modernized corporate governance. The general meeting of shareholders, which can be considered legally as the acting principal in the classical corporate governance principal agency relationship, can become a fast and lean actor that not only can be a driver for a modernized relationship between the board of directors and the shareholders, it can open a debate for a new equilibrium of the division of powers between the shareholders and the board of directors.

Using a blockchain technology, corporate decision-making can be faster and cheaper for companies and shareholders. However, it is important to bear in mind that the new technology is still in an exploratory stage and that there are many (technical) legal aspects that need to be taken into consideration and, not unimportantly, need to be further studied. To name but a few of the many (legal) issues: How can a Q&A session be structured in a 'fluid meeting' process? Can a 'meeting' in a blockchain environment be postponed? Can acting in concert take place both 'on' and 'off' blockchain? What should be the role of the external auditor? These and other questions offer important avenues for future research.

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