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Blockchain's role in reducing transaction costs: a review of the literature, theories and models

Le rôle de la blockchain dans la réduction des coûts de transaction : une revue de la littérature, des théories et desmodèles

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Abstract:

Much attention has been directed towards digitization's potential effect on both transaction costs and organizational designs over the past few years. In particular, digitalization is argued to dramatically lower transaction costs, not only within organizations but also across multiple entities. Blockchain technology firmly positioned itself within mainstream awareness as the groundbreaking emerging technology. The emerging blockchain technology holds the promise of removing the requirement for trustworthy entities (central intermediaries) to secure transactions through digital systems.

This paper explores the positions of this technology in cost management through the prism of the institutional transaction costs economy approach

We argue that technology based on blockchain has significant promise to help to reduce both economic and social cost impact on the transaction. We employ the setting for developing better insight into different industries & corporate functions in which information asymmetries between the buyer and real estate promoter as well as the associated transaction costs involved in the property transfer are large and frequently intractable.

We outline the ways in which blockchain technologies embedded in a decentralized transaction-based system can help overcome these issues in the area of asset management. Our results suggest that information sharing regarding assets performance moderates both the effects of contractors-side adverse choice as well as decrease the vertical moral hazard of assets through generating a disciplinary incentive. Additionally, in this work, we find evidence of an incentive for assets to exhibit opportunistic behavior when value-added Information of the asset nature are available.

Keywords: Block chain, Smart contract, Asymmetric information, Transaction Cost, Contract law, Moral hazard

JEL Classification: D00

Paper type: Theoretical Research

1. Introduction:

Blockchain platform-enabled technologies possess the potential to disrupt a range of industries (de Soto, 2017; Potts et al., 2017). Indeed, to date, we havewitnessed firsthand what disruptive impacts cryptocurrencies, which include Bitcoin and Ethereum, are having on the current finance revolution, the onlinecurrency markets, and online purchase & sale of property and services (Tapscott, D, & Tapscott, A. 2016).

The decentralized character of the blockchain technology, combined with sophisticated algorithm-based generating of trust, absence of any intermediaries as well as insignificant collateral risk, has huge potential ramifications for corporate economics (Evans, 2014), (Narayanan et al., 2016).Yet whereas some research has surfaced regarding several aspects of blockchain currencies as well as some specific uses of the technology, studies examining the economic and entrepreneurial dimensions of blockchain technologies have been limited. (Catalini and Gans, 2016).

Based on narrowly scoped research, a number of entrepreneurial opportunitiesare presented by blockchain technologies within the fields of beyond the banking business conduct (Larios-Hernández, 2017), rising market patterns (Morkunas et al., 2019), and financing strategies for young companies (Akbarpour, 2019); (Tumasjan et al., 2019) (Ante et al., 2018). Due with regardto the suitability in entrepreneurial settings of so-called blockchain technologies as well as anecdotal proof of the pros and cons of deploying digital currencies to fund business startups, the present economic discussion outlines the necessity of investigating both of these topics utilizing strong design as well as disciplined methodological models.

Led by this ongoing scientific discussion, this section explores the positions ofthis technology in cost management through the prism of the institutional transaction costs economy approach. For decades, transaction cost economics dominated scientific discussions on institutional economics. Ronald Coase pioneered the discussion on how transaction costs shape the way firms and markets operate through his fundamental paper "The Nature of The Firm".

Kenneth Arrow further elaborated the argument in 1969, with his influential paper on “the Organization of Economic Activity” in which he outlined how transaction costs contribute to both market failures and intermediate product contracts. This argument was furthered by Williamson (1971, 1981, 2002) applying transaction cost economics in order to explain a variety of aspects ofthe market as well as agency economics, including vertical integration, corporate governance, coordination, and contract failures. In today's digital age, we explore the economic decision-making involved in smart contract- based blockchain technology as an alternative for asset management. Practically speaking, transaction cost economics theory and predictions illuminate the way through which. The potential for blockchain technologies toshape organizational decisions within a firm lies in its capacity to simultaneously both decentralize as well as minimize the costs of

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transactions(both economically and socially), therefore establishing trust among trading parties.

We argue that technology based on blockchain has significant promise to helpto reduce both economic and social cost impact in the transaction (Chen et al.,2018), with regard to cost and convenience. We employ the setting for developing better insight into different industries & corporate functions in the economy. As such, one of the focuses of this paper is asset transactions in which information asymmetries between the buyer and the real estate promoter aswell as the associated transaction costs involved in the property transfer are large and frequently intractable.

Specifically, we outline the ways in which blockchain technologies embeddedin a decentralized transaction-based system can help overcome these issues inthe area of asset management. Studying the asset management features of smart contracts certainly appears to be a timely and highly relevant venture. Over the course of 2017, blockchain technology firmly positioned itself withinmainstream awareness as the groundbreaking emerging technology underlyingcryptocurrencies, as more and more business startups piloted additional applications potentially leading to disruption in a spectrum of roles and sectors(Davidson, De Filippi, & Potts, 2018). Thus, Blockchain must be understood as more than simply a breakthrough technology.

In the view of (Davidson, 2018), provides a different form of economic regulation and requires a change in the way in which transactions are conducted, the same idea is shared by (Piazza, 2017). As a result, blockchainsought to be more fully explored through the eyes of institutional economics. (Davidson et al., 2018), endowed with the necessary constructs, tools, and methodology to investigate economic coordination.

The following contribution considers TCE as our theoretical lens for a numberof reasons. Firstly, the primary novelty of blockchain lies in the fact that it delivers a novel way of coordinating economic operations, which is what the TCE focuses on (Davidson et al., 2018); (Menard, 2018) ; (Williamson, 2002).

Secondly, the use of blockchains provides a new form of the organization whilealso addressing the diversity in organizational patterns that are often seen as the central focus of TCE (Williamson, 1998).

Three, TCE's adoption is heavily backed by the fact that it is relevant to entrepreneurial economics (Williamson, 1988). This enables smart contracts, being both a financial instrument and an embedded piece of blockchaininfrastructure governance, to be examined in an embedded way.

Fourth, TCE explores both organizations from a contractual perspective as wellas implies the basic unit from which to analyze them (Williamson, 1996, 2002).Given that blockchain is trading (i.e., transaction) rather than a production technology, this latter can be studied in an embedded manner.

(Davidson et al., 2016); (Conley, 2017) paired with having the strong ability to lower costs of transactions and stimulate market opportunity (Catalini and Tucker, 2018), as a result, smart contracts are the core of these endeavors (Bakos and Halaburda, 2018).

The remaining of the paper will go as follows:

Section 2, we shall go through the transaction cost theory lenses in order to comprehend the various costs related to the contract. In section 3, we will attempt to present the necessary parameters to incorporate the blockchain technology along with the TCE theory. In section 4, we outline the blockchain role in reducing asymmetric information within the markets as well as addressing issues related to the literature. Section 5 will propose a decision-making architecture to adopt smart contract as a potential solution for reducing contracts. Finally, Section 6 will be devoted to conclude this work together with presenting some possible future research directions.

2. Transaction Cost Economics Theory

The notions of "transactions" and "costs" are the focus of the economic theoryof transaction costs. The term transaction is used to describe the process of shifting a commodity or service unit, whereas transaction costs are the total amount of both monetary and non-monetary resources required to complete the transaction. Also known as "transaction costs". Occur as a result of the combination of environmental uncertainty, limited rationality, expediency, and the asset-specific nature of the transfer. Both environmental uncertainty and limited rationality create inefficient contracts and poor decision-making.

Together, these factors render the existence of informational full contracts, as suggested by neoclassical economics, that without full contractual arrangements, it is probable that one or the other party involved in thetransaction will be able to pursue opportunism and to extract personal economic gains (Williamson, 2008). As such, trust in the transactions will become a critical element in the relationship between parties. Blockchain technology holds great potential to surmount the issue of trust by using mathematical algorithms and distributed networks.

The cost of transactions is expressed as ex-ante and/or ex-post expenses (Williamson, 1985). The ex-ante costs are associated with negotiating and making contracts, and ex-post costs involve the costs of establishing and maintaining governance systems. The governance requirements emerge from and link with contractual uncertainty.

If full contracts can be drafted at an affordable cost, then there would be no need for additional management. All contracts, though, are incomplete as a matter of necessity, due to three reasons:

- In a complex or highly uncertain environment, it is hard for individualsto plan in advance and predict all possible outcomes;
- it is tough for contract parties themselves to negotiate the schemes;

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- It is impossible for counterparties to draft their contracts so as to ensurethat, in the event of that in case of a legal conflict, an external agency could interpret the significance of such drafts and ensure their enforcement (Hart, 1995: 23).

Therefore, the economic actors write partial contracts (i.e. ones with incomplete clauses and lacking terms). Contractual uncertainty entails the presence of random contracts that generate transaction costs. TCE aims to identify, understanding, and reducing all sorts of contractual uncertainties via governance (Williamson1996). The contractual uncertainties are as follows:

- Risks related to poor property rights;
- Valuation risks;
- Intertemporal threats (which can take the shape of imbalanced agreements, policy violations);
- Contractual risk.

An additional element affecting transaction costs is the particular nature of theasset. A high asset density is defined as one that is not easily reallocated for other uses, whereas an asset that may be used for another purpose has a low asset density.

For instance, if a supplier engages in significant investment in assets used to produce a commodity for a specific buyer. The vendor has ensured that its assets are unique to its customer. If the provider is unable to accommodate thecustomer's expectations, he offers the latter the possibility to reduce the price significantly to prevent losing the asset value.

Economic actors can match transactions to structural governance (in our case blockchain protocols) to minimize transaction costs (Williamson 1985, 1996).

As achieving alignment involves the need to understand where transactions and structures of blockchain differ on different aspects, TCE approaches the issues of which transaction aspects present various risks, for as long as one understands which component of blockchain design alleviates risks, and at what additional cost? Secondly, assets are required to be tied to transaction costs and qualifications of alternative scenarios (Williamson,1985, 1998).

Contract contingencies result due to any of the following transaction characteristics:

- Transactions frequency,
- Uncertainties faced by transactions,
- Asset attributes (Williamson, 1985).

The more frequent transactions, the higher the level of risk, while the higher the asset particularity, the more expensive it is to transact. Among these threefactors, asset specificity is seen as being the most informative, as it leads to bilateral dependence, the anticipation of which decreases the incentives for the asset investment agreement due to the fear of adding more clauses by each party, thereby providing a significant boost to embedding (Hart, 1995).

For their part, these critical governance structure aspects comprise

- Contract legal form (judicial or private order)

- Autonomous and collaborative adjustment efficiency,
- The intensity of inducements,
- Government monitoring, leading to different costs and expertise configurations of the trading platform (source of the code) (Williamson, 1998).

Institutional structures emerge in response to transactional requirements for contracting. The marketplace provides a more straightforward and lower-cost privileged regime of governance compared to the hierarchy, and thus represents a preferred choice. The internal transactional arrangement is unable to duplicatethe incentive supply provided by the market and involves administrative costs;so on-chain economical actors may be considered as an alternative form of organization as the last option.

Straightforward transactions can be carried through efficiently within themarket, whereas a more sophisticated market mode is the most preferred governance structure if the asset nature is low, there are fewer transactions andless uncertainty. The greater the degree of specialization and the lower the levelof substitutability among products, the more suitable it is to conduct transactions on an internal basis.

Blockchain and Transactional Cost Theory Marriage or Illusion

The economics of transaction costs allows us to grasp the impact of new technology on organizations and organizational structures. Transaction cost economics argues that differences in the nature of technology generate different contract risks (Williamson, 1998). As a result, the structures of transaction costs are modified due to technological progress, requiring an adjustment to the structures of governance. In addition, technology also altersboth the costs and the capabilities of governance structures.

Due to interventions, organizations are being recovered. During this process, new organizational structures may emerge. A wide range of researchers have expanded beyond traditional framing of the transaction problem as a market/firm dichotomy to include a broader Grid discussion (Blois, 1990); (Economides, 1996); (Baker, Gibbons, Murphy, 2002), with the inclusion of joint endeavors (Hennart, 1988); (Jarillo, 1990), and managerial grids (Windsperger, et al, 2018).

Reaching outside the classical hierarchy and contract forms of organization mirrors the important ways in which business has changed, including a spectrum of both formal and informal arrangements. Such unconventional modes of the organization were modeled as being hybrids (Williamson 1991; 1985), (clans Ouchi, 1980), as well as networks (Miles, Snow, 1986; (Powell,1990).

Much attention has been directed towards digitization's potential effect on both transaction costs and organizational designs over the past few years (Loebbecke, C., Picot, 2015); (Teece, 2010). In particular, digitalization is argued to dramatically lower transaction costs, not only within organizations but also across multiple entities (Butler et al., 1997). The shift in the structureof costs (sizable upfront investment and trivial or small incremental costs) along with changing competitive

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nature. Parker in his idea of «winner-takes-all" places the scalability aspect at the forefront of attention (Parker and Van Alstyne, 2005); (Van Alstyne, et all, 2016).
This phenomenon, together with the lower transaction costs due to digital platforms (Lobel, 2018), has resulted in a growing focus on the internet of things (The Economist, 2017). The increasing attacks against centralizednumerical platforms (Facebook, Google, Amazon, etc.) related to alleged
deficiencies in transparency, enabling one-time failures as well as censorship,abuse of power, or other inefficiencies (Lange, 2017). Trustworthy middlemen,though, were viewed as critical to conducting transactions for business agentswho were unable to rely on each other to complete online trades.
The emerging blockchain technology holds the promise of removing the requirement for trustworthy entities (central intermediaries) to secure transactions through digital systems. The analysis of the transaction economicsassociated with blockchains to centralized digital platforms is expected to include its human component - such as smart contracts, auditing of transactions, and tokenization. The smart contract will be examined within this paper as a new way of reducing transactional costs while embracing the level of trust between the parties.
Smart contracts outline terms which, once fulfilled, will automatically enforcethe agreement(s). Although smart contracts can vary in complexity, the encrypted data requires precision and detail, with no room for possible misunderstanding. If the requirements described in the smart contract are not fulfilled, then the transaction will not be implemented and neither party is obligated to one another.
Since smart contracts (as described later in the next sections) can be coded, they can encompass a wide spectrum of agreements and arrangements outlining the parties' respective commitments under various states of the world.For more complex scenarios, however, they do not provide full functionality, since drafting a full contract is potentially expensive. If a particular world stateis not included, the deal will not go through. Because the parties agree on the use of a given smart contract and, therefore, the legal code or litigation that may arise will be fairly uncomplicated, given the fact that human-based error will not be taking into consideration in the "decision" to complete the transaction. Smart contracts need to be considered as the "what if, then" rule, allowing no margin for additional legal interpretations.
The key idea behind the process is to economize on administrative fees, by cutting middlemen from the transaction equation. However, these advantages come at the expense of adaptability.
Not permitting confidentiality entails significantly decreased transaction costs.Yet, such advantages are achieved at the cost of scalability. As a consequence,the smart contract governance framework requires additional governancemechanisms. When a requirement for improvements in the code is identified, such a motion is passed among the token holders (more details in section 3of the paper).

From the standpoint of governance, utilizing self-executing smart contracts is noticeable as it removes the requirement for daily management, liberating blockchains from any human errors or agency challenges, as well as minimizing the potential for litigation between contracting parties.
At the same time, smart contract code is nowhere a perfect symphony, huge attacks were conducted by hackers throughout the years. The risk of bugs & attacks is a form of contract hazard that is indigenous within the digital sphere.While writing a smart contract bug-free is problematic, they can be tested formally (i.e., albeit difficult), employing a set of methodologies that allow formathematical verification as to how well it behaves in compliance to a specification, thereby providing improved risk management over traditional approaches, such as peer testing and review (Kasireddy, 2017).

3. Uncertainty Due to Asymmetric Information

The theory of economics suggests that while sharing information contributes to the dissolution of adverse choice problems and helps to avoid moral hazards, the strategic rationalities of both sides of the marketplace are crucial factors that determine the true impact caused by increased transparency. (Pagano andJappelli, 1993), in their foundational study, examine individual banks' motivation for sharing information and identifies both borrower mobility as well as heterogeneity, the size of the market, and improvements in informationtechnology all as positive incentives for sharing information. By contrast, the fear of competition impedes the sharing of information.
Overall, the authors' model points towards an effective mechanism for reducing adverse selection. Meanwhile (Padilla and Pagano,1997) expand on(Pagano and Jappelli, 1993) and note that informational sharing decreases expected future earnings by equalizing information among banks, while at thesame time enhancing the odds for success in the present. Ultimately, the resulting trade-off between more competitions over the future versus higher returns of today shapes banks' willingness for information sharing.
The strategic aspect of sharing information is highlighted by (Bouckaert and Degryse, 2006), who demonstrate that existing banks restrict information sharing to the outcome of a project so as to discourage potential newcomers.
Following this logic, both (Gehrig and Stenbacka, 2007) imply that the informational monopolistic rents gained through relationship information are diminished due to information sharing, but also emphasize that this makes it more profitable to poach (Bennardo, Pagano, & Piccolo, 2015). Nevertheless, both (Karapetyan and Stacescu, 2014) also highlight that such loss in information rents provides incentives to lenders to raise their investments in the acquisition of more information so as to regain their monopolies.
From the perspective of the marketplace(Bennardo et al, 2015) anticipate that sharing information increases coordination across individual lenders and thereby

reduces entrepreneurs' incentive to over-leverage when loaning from multiple banks.

Consequently, both interest, as well as default rates, decline, and the access to finance increases. However, when distressed, the increased coordination across lenders increases the probability of defaults even more (Hertzberg, Liberti, and Paravisini 2011).

Overall, the literature examined that information-sharing agreements has a number of valuable insights with regard to blockchain technology: Firstly, it contributes to our understanding of the capacity of the blockchain recording as a means of sharing information. Research conducted by (Kallberg and Udell, 2003) and (Dierkes et al,2013), in particular, suggests that sharing informationthrough the distributed and full record of blockchain's historical transactions isa powerful tool for mitigating the challenges posed by both pre-and post-contractual information asymmetries (Padilla and Pagano, 2000) ; (Beck et al.,2004) and facilitating the coordination among users (Bennardo et al., 2015) ; (Hertzberg et al., 2011); (Bertrand and Morse, 2011) ; (Brown and Zehnder, 2010). Yet, in order to ensure a positive impact, both the (time) scale(Diamond, 1989) ; (Vercammen, 1995) and scope (of content) (Padilla and Pagano, 2000) ; (Bouckaert and Degryse, 2006) of released information must be done with caution.

The impossibility of deleting previous transactions, at least, poses a particular challenge, since disciplinary impacts fade as records become longer (Vercammen,1995). Moreover, the unchanging and tamper-proofcharacteristic of the blockchain prevents and thereby minimizes the impact ofdata editing (Giannetti et al., 2017) - in the digital world at least (Hawlitscheket al., 2018). Secondly, it outlines possible avenues through which changing the characteristics of transparency might influence behavioral patterns and marketplace outcomes.

More precisely, using a database updated and shared consensually narrows down the competition (Pagano and Jappelli, 1993), downgrades the informational monopolies (Padilla and Pagano, 1997, 2000); (Bouckaert and Degryse, 2006), and enhances marketplace access, size as well as efficiency (Djankov et al., 2007); (Brown et al., 2009).

Furthermore, sharing previously non-public information from the supply side reallocates demand-side rents (Padilla and Pagano, 1997) and generates a disciplinary element that attenuates opportunistic behavior (Padilla and Pagano, 2000). It is the trade-off between those elements that shape the welfare impact, information-sharing motivation, as well as the policy rationalities on both sides of the market (Bouckaert and Degryse, 2006); (Sharma, 2017).

4. Literature Challenges:

Despite these similarities, there is also a crucial difference between the informational system upon which traditional information-sharingarrangements and blockchain-based information arrangements are constructed:Conventional settings constructed upon central information systems serve a specific range of information to a limited group of users.

Therefore, banks get access to information about the whole market, whereas contractors can only afford access to their own information. The design of blockchain, in contrast, doesn't restrict access rights from individual users and discloses stored information publicly. Therefore, blockchain-based systems guarantee the integrity of data and facilitate accurate database upgrades without a central authority. Hence, everyone involved in the system benefits from an equal level of information.

As such, to fully unlock the full potential of blockchain, it is essential that we understand any potential side effects that come with moving toward the public transparency register. More specifically, in informational asymmetric markets with differences in quality, increasing transparency does not only reduce uncertainty but also enables opportunistic users to leverage quality information in an effort to maximize their own personal earnings.

To illuminate underlying behavior patterns and findings as well as to identify any potential risks of blockchain adoption, we frame two new research questions that will be considered in the first section (section literature classification by the systematic mapping study) as follows:

Search Question 1. What are the ways in which the availability of legal information about assets affects individual participants' behavior on the market's demand-side?

As part of the related analyses, we explore questions such as what party changes its behavior in the transaction from a legal perspective, as well as howand why these changes occur, and evaluate the resulting legal outcomes.

To do this, we establish an analytic model of data breaches and discuss the incentives for behavior change in contracts, the outcomes that come with change, and the unraveling effect over time. Furthermore, we look at various system settings and tie individual outcomes to features of the social and economic environment (section 4). Yet the effect of behavior changes is notconfined to the individuals but also impacts the marketplace and the overall economy.

Research Question 2. Do changes in the transaction on the demand side affect the overall economy and the performance of the asset market?

The scope of this research question includes welfare effects along with the impact on the asset market side. As a result, we examine if the changes in the transaction improve or impair the cost as well as what factors shape these effects. Lastly, transferring the findings of research questions 1 and 2 to a practical application setting (section 4) is also key to supporting researchers as well as practitioners with their blockchain efforts.

As previously stated, it is planned to negotiate a network of subcontracts to fill in the gaps. According to agency theory (K.M. Eisenhardt, 1989), the principal-agent bias due to asymmetric information can cause behavioral uncertainties during all

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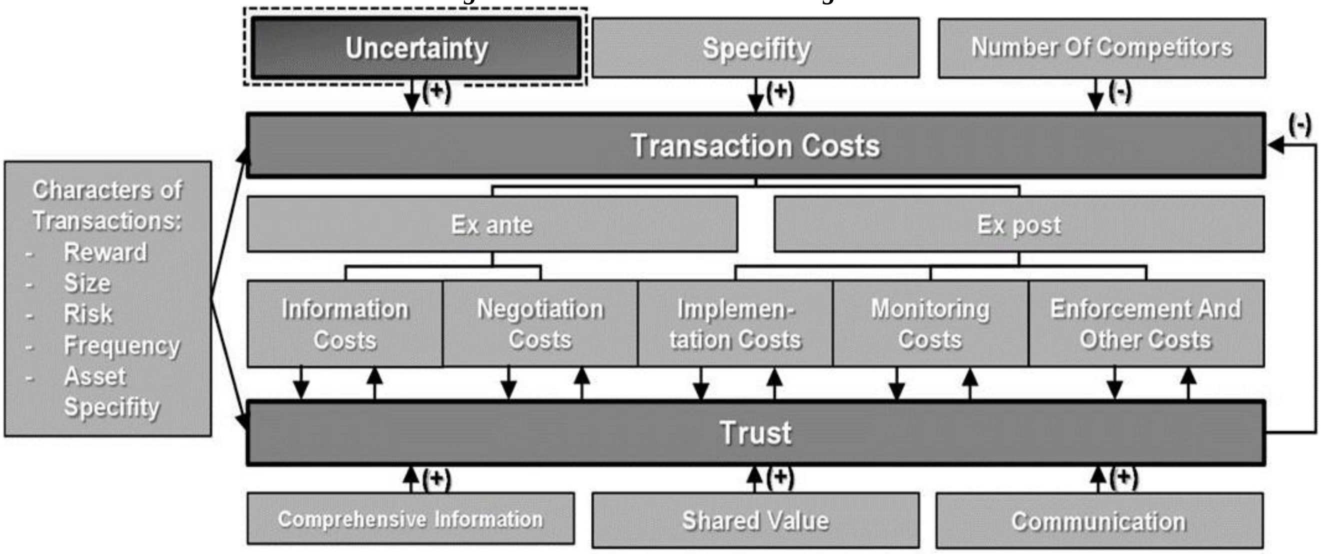
the stages of the transaction, both prior to hidden features as well as after the conclusion of the contract (hidden intention and concealed action), in part due to asymmetric information among market participants (K. Spremann, 1990); (R. Cai, 2004). Following, asymmetric information within cooperation can be avoided using concepts such as disclosure of information (signaling), the long-term engagement or (financial) incentives. Apart from uncertainty, the transaction costs, as well as trust, can be affected by the number of competitors in such ecosystem, shared value, comprehensibility of shared information, and communication possibilities (J. Lee,J. Kim, J.Y. Moon, 2000).
A diagrammatic outline of the interactions cited between the trust and transaction costs is solidified from literature and shown in (Figure 1).

Figure 1 : Transaction interaction grid



Source : (R. Cai, 2004)

5. Proposal of a decision-making architecture to improve the performance of the smart contract

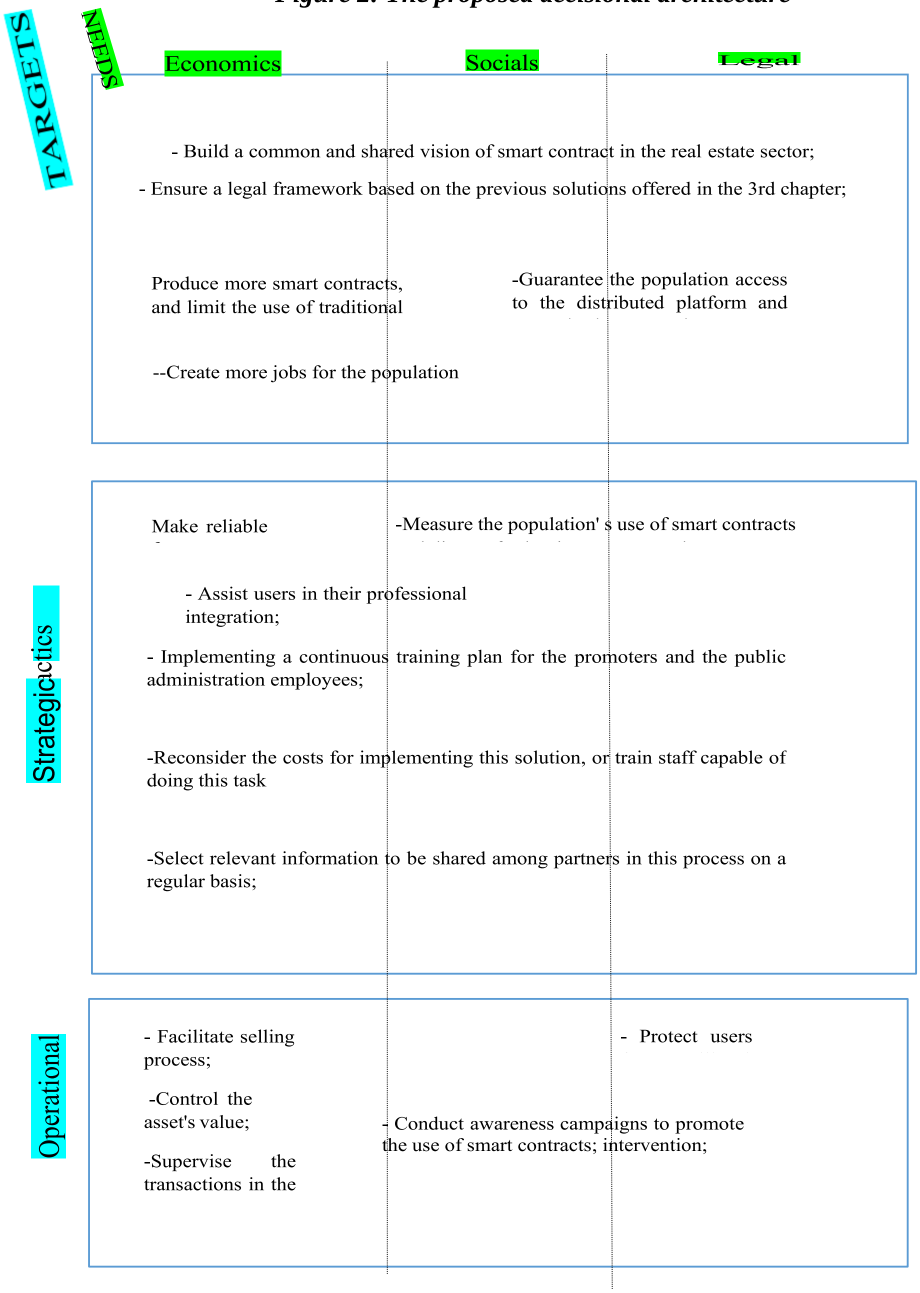
In order to improve the performance of smart contracts in the real estate sector,we propose a different approach than the previous solutions, which consists insolving the problem of trust in blockchain in Morocco following the best practices of blockchain.
Originally, early papers defined trust in blockchain as a new approach to management, allowing the integration of internal and external processes of a company, to find a compromise between low costs and the best level of service.
With the popularization of the blockchain concept in various industries, this definition has evolved.

Finally, several authors propose a consensus definition of trust from theliterature. It is a set of best practices for managing a network of intra-companyrelationships and/or interdependent functional units, including stakeholders and related systems, enabling the direct and reverse flow of services, costs, andinformation from the original promoter to the final customer, creating value and optimizing profitability through efficiency, and through customer satisfaction.

According to the literature, smart contracts can lead to impressive improvements, especially through the implementation of advanced security systems resulting from the ERC 20.

However, one of the reasons why blockchain projects generally failed in the regional and even the national economy is the inadequate alignment of the keyconcepts of blockchain with the legal strategy of the concerned countries. Thethree key concepts of blockchain solution implementation are transparent network organization, appropriate process planning, and performance measurement of the solution. It is therefore necessary to propose practices of smart contracts in the real estate sector in Morocco consistent with the strategy of distributed systems. Thus, after having analyzed the state of the art of smartcontracts, we propose a decisional matrix allowing us to align the economic, social, and legal needs, with a suggestion of good practices.

Figure 2: The proposed decisional architecture



Source : Auteurs

The proposed decisional architecture (figure 2) represents the objectives at the strategic, tactical, and operational levels, allowing answering economic, social,and legal needs.

Decision levels

The strategic level includes the long-term decisions where the stakes are the highest. These decisions may include the choice of platforms, the type of partners, installations, and the technologies and resources used.
In this respect, the literature has proposed a decision-making aid for managers wishing to initiate a collaboration project, by choosing the right environment for collaboration in terms of the number of partners, the weight of the investment, and the duration of the partnership.
To do so, the authors conducted a performance analysis of the smart contract based on 3 indicators: the efficiency of the solution, the cost, and the transparency of the process.
The tactical level involves the management decisions of the smart contract taken in the mid-term. These decisions include the planning of transactions aswell as the choice of effective mining methods.
Finally, operational level decisions are taken for a short-term horizon in orderto ensure the daily operational functioning of the smart contract. At this stage,the configuration of the smart contract and the legal management policies are already fixed.
For example, it is a matter of deciding on the framework capable of managingthe different types of contracts, along with scheduling the production ofcontracts. These decisions are conditioned by the previous levels. We notice
that the literature on the value of smart contracts in ownership transfer is mainly related to the strategic and/or tactical decision levels.
The potential customers are likely to choose to engage their clients in blockchains over centralized platforms if the latter provide them a share of theprofits from their growth. Asset tokenization would not only induce usage butwould also work towards the alignment of interests among all its holders.
For this reason, their attribution to relevant parties at the stage of the transaction process ought to prevail over a purely financial objective consistingof maximizing the issue's proceeds.
We urge researchers in corporate finance to launch studies aimed at measuringthe importance of minimizing transaction costs of strategic decisions taken byinvestors within the marketplace.
Two different possible approaches to studying the TCE paradigm in blockchain are the following: The evolutionary approach and the Managementdecision-making approach.
The evolutionary framework suggested here is best suited to examine smart contracts within the framework of the entrepreneurship paradigm, researchersmay consider whether or not cost minimization is related to Investissement decision-making by stakeholders within the marketplace. Researchers can thenexpand their funding options by using the smart contract template offered hereor any other application based on blockchain technologies. (e.g., trust and uncertainty) to

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determine whether other areas in the entrepreneurial landscapeare mature enough for blockchain technology implementation.

6. Conclusion

Using a set of encrypted rules within the blockchain protocol, so-calledblockchains will aggregate as well as cooperate with a distributed peer-to-peernetwork, thereby removing the requirement for a central agency as well as daily management, promising to decrease the typical coordination problems of hierarchical organizations, including large amounts of overhead, human error,as well as agency problems, thereby reducing transaction costs significantly.

Yet through their design, blockchains can build upon cooperative adaptation and its advantages. The purpose of tokenizing assets is to blend the low cost ofrules-based governance with the extra scalability that's typical of action-basedgovernance.

The selected approach is to combine their function in smart contract implementation with their role in the consensus process. The overall idea is the traditional stakeholder relationships are combined, duplicated, and fused in blockchains.

With tokenization, investors may be expected to assume additional roles that extend past their traditional rights & duties to include nodes, validators, clients,and resolvers of disputes. The merging of such roles and the resultant urge toward reimagining and redesigning transactional parties' relationships as well as defining their roles.

Ultimately, the discussion suggests a potential role for the blockchain and smart contracts across various industries that are expected to hinge on contractual contingency structure and transaction cost incentives.

A recent study conducted by (Liu and Tsyvinski (2018) found that there are likely to be winners and losers from the shift toward the use of blockchain technology and related cryptocurrencies. In regressing the stock market returns
for each industry in key cryptocurrency returns and stock market excess returns, they have found positive correlations for instance in consumer goods,health care, and negatively for the asset trading industry (finance).

Due to a lack of theoretical proof, these findings must be viewed with considerable caution. Transaction cost economics offers a theoreticalframework for developing proposals regarding blockchain and smart contract prospects within each sector and testing them within comparative contexts.

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