The role of Blockchain in Social Finance

Wolfgang Spiess-Knafl
Gian-Luca Gasparini

febea FÉDÉRATION EUROPÉENNE DES FINANCES
ET BANQUES ÉTHIQUES ET ALTERNATIVES
EUROPEAN FEDERATION OF ETHICAL AND
ALTERNATIVE BANKS AND FINANCIERS

EUROPEAN CENTER
FOR SOCIAL FINANCE

The role of Blockchain in Social Finance

This paper is written by Wolfgang Spiess-Knafl (European Center for Social Finance) and Gian-Luca Gasparini (FEBEA).

Wolfgang Spiess-Knafl is the Managing Director of the European Center for Social Finance, which delivers Technical Assistance services on behalf of FEBEA. He has an engineering background and started his career in investment banking. Wolfgang has been active in the field of social finance since 2009. His current main interests are emerging new technologies and their intersection with social and environmental objectives.

Gian-Luca Gasparini is FEBEA's Capacity Building Manager and Project Manager. With a background in international development and economics, he attended specialisation courses in Project Management and in Financial Education programme design and implementation. He previously worked as Liaison Officer for the Italian Ministry of Foreign Affairs and as Project Manager at SEFEA, a FEBEA member.

The paper is based on a workshop that took place on April 28, 2023 with FEBEA members and the book "Artificial Intelligence and Blockchain for Social Impact". We thank the participants for providing their valuable insights.

FEBEA Position on Blockchain Technology

FEBEA remains dedicated to fostering innovation in both ethical banking and the broader banking industry. Ethical banks play a crucial role in democratising finance, fostering inclusivity, and supplying capital to social sectors that are often overlooked by traditional banks.

We see the opportunities to enhance the way ethical banks contribute to the social economy and support social economy organisations in improving the services and increasing transparency using the blockchain technology.

Nevertheless, we emphasise a few concerns:

1. Speculative tendencies: Blockchain technology is best known for the cryptocurrencies, which too often have a speculative nature. Tools deployed in the social economy should minimise or eliminate speculative components.
2. User-friendliness: It is still not easy to onboard users in a blockchain-based ecosystem. There needs to be more innovation around easy-to-use wallets.
3. Balance between centralisation and decentralisation: blockchain technology is also known as distributed ledger technology which hints at the decentralised nature. It is important that the technology maintain its openness in all aspects.

This paper was developed as part of a workshop that took place on April 28, 2023. FEBEA members participated in the discussion and shared their views on the topic.

1. Introduction

Blockchain technology, also known as distributed ledger technology, has generated almost as much debate as Artificial Intelligence in the last years. Just consider the discussions around cryptocurrencies and non-fungible tokens (NFTs).

At its core, blockchain technology is basically a technology which enables participants to share a common database or ledger. Ledgers have always been central to our lives. They are important for bank accounts, land registries, access to a gym or list of newsletter subscribers. Unsurprisingly, some of the earliest examples of written documents in the human history are transaction records.

Blockchain technology, also known as distributed ledger technology, eliminates the need for a central ledger by distributing transaction information across multiple ledgers. Consensus mechanisms ensure that all participants in the network have the same information at the same time. Consensus mechanisms also guarantee the integrity of the data. It is almost impossible to change the details of data stored on a blockchain(1).

Blockchain technology enables secure storage and algorithmic governance, fostering trust in transactions and information. It provides transparency, privacy, and a single trusted source of information(2).

There are different levels where blockchain technology can be implemented as outlined in the following table.

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(1) There are many sources such as blogs, online courses, academic papers or books to understand the basics of the blockchain technology. A good introduction to the cryptography is Simon Singh, *The Code Book: Science of Secrecy from Ancient Egypt to Quantum Cryptography: The Science of Secrecy from Ancient Egypt to Quantum Cryptography,* Reprint Edition (New York: Anchor, 2000) and to the development of the field Ben Mezrich, *Bitcoin Billionaires* (Luitingh Sijthoff, 2019).
(2) Trust is a key principle in blockchain technology, with reputations built on a track record of actions meeting stakeholders' expectations. Blockchain serves as a historical record of events, creating meaningful information and helping establish trust in various contexts.

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Aspects	Social finance intermediary	Social economy organisations
Main aim	Allocate funding to organisations	Deliver services and create social value
Potential Tools	Impact tracking, conditional funding, reporting compliance, conflict mediation, algorithmic lending	Governance structures, community networks, asset storing, documentation

Table 1: Different levels

Source: Own illustration

2. Relevance for social finance

Blockchain technology is a financial technology at its core. The first implementation was the cryptocurrency Bitcoin, which enabled users to buy goods online anonymously. At the beginning, it were often illicit goods bought on websites like SilkRoad(3).

The second wave of developments happened with the introduction of smart contracts. Smart contracts are basically programmes in the form of *if-then* statements: whenever a certain event takes place, the smart contract automatically executes the next steps. It is possible to think of smart contracts as automatically executed operations without any form of counter-party risk.

Once the code is written and deployed on the blockchain, the smart contract is immutable, meaning it cannot be changed or tampered with. For this reason, some like to say that "code is trust". Nowadays, a range of products exists, such as algorithmic lending, decentralised exchanges or instantaneous payments.

MakerDAO is a good example to show how automatic lending could work inexpensively(4). MakerDAO is a decentralised lending platform that has mobilised over $7 billion in assets. Users deposit approved assets into a smart contract called a vault, which functions like a collateralised debt position. Borrowers are required to over-collateralise their loans, with collateralisation ratios ranging from 102% to 5,000%. In return, they can withdraw a US Dollar-pegged stablecoin called Dai.

MakerDAO's governance is highly transparent and decentralized, with the Maker (MKR) token enabling holders to vote on risk parameters, budgets, and other aspects of the platform. However, only a small percentage of tokens are actively involved in governance, which could pose risks to the platform.

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(3) These online marketplaces for illicit goods would not have existed without a way to pay for the services as described in Nick Bilton, *American Kingpin: The Epic Hunt for the Criminal Mastermind Behind the Silk Road*, Illustrated Edition (New York: Portfolio, 2017). These transactions were also responsible for up to 10% of the total transactions of the network Nicolas Christin, "Traveling the Silk Road: A Measurement Analysis of a Large Anonymous Online Marketplace," in *Proceedings of the 22nd International Conference on World Wide Web*, 2013, 213–24.
(4) More information can be found in the technical documents (https://docs.makerdao.com/) or the borrowing platform (https://oasis.app/borrow).

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One of the main benefits of blockchain technology for social finance is its ability to increase transparency. Transactions are recorded on a decentralised ledger that is publicly visible, meaning that investors and clients can track the use of their funds and ensure that they are being channelled to achieve the intended social or environmental impact. Additionally, the use of smart contracts on the blockchain can enable the automatic execution of agreements between parties, further increasing transparency and reducing the need for intermediaries.

There are various initiatives and projects that have been developing and experimenting with these approaches(5). GiveTrack was a platform that allowed donors to track the progress and use of their donations for various projects.

The challenge of verifying the quality of evidence for war crimes has led to organisations like the Syrian Archive, which stores and verifies data related to war crimes using blockchain technology. HeHop is a digital safe for victims of domestic violence to document their injuries through images, audio recordings, or videos. The platform timestamps, signs with a private key, and adds GPS data to the files, creating legally valid documents for judicial purposes.

These approaches are also interesting for funding organisations. In the webinar we have discussed the following case:

You are funding (through grants, loans or equity investments) a social economy organisation and want to make sure that the funding is used for green or social purposes. Organisations are reporting their data on a quarterly or annual basis.

How do you make sure that the data is reported on time and transparent? How could third parties audit your data?

How do you manage the process with 50 or 5,000 organisations?

In such cases, a timestamp might be an interesting option.

(5) The links to the projects described are GiveTrack (https://www.givetrack.org/), Syrian Archive (https://syrianarchive.org), HeHop (https://hehop.org/)
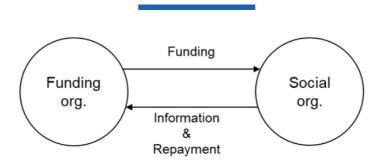
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Figure 1: Relationship between funding and social organisation

Source: Own illustration

In the webinar we have also discussed the following case:

Suppose that you are willing to pay a certain amount for a specific service (e.g., €20 per night for homeless persons, €100 per month for each child receiving afternoon education or €5 for each vaccination). Everyone with a good solution is entitled to receive the payment.

It would be feasible to set up such a market platform where social organisations are paid whenever they deliver pre-defined services.
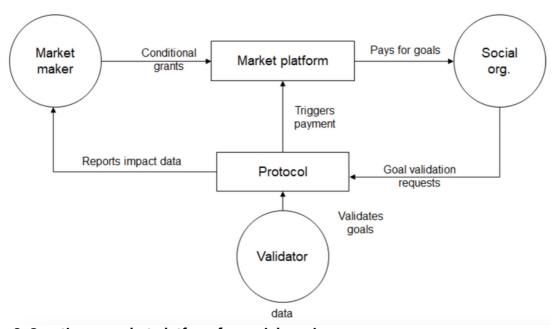

Figure 2: Creating a market platform for social services

Source: Own illustration

3. Relevance for the social economy

Blockchain technology offers a vast design space with potential for combining economic incentives, algorithmic commitments, and instantaneous payments in a secure and verifiable environment. The technology has given rise to various business models and has been used in the pursuit of social good. However, some projects claiming societal benefits lack substance and are driven by marketing slogans(7).

Blockchain technology can be used to create new business models as outlined above and discussed in the case study. Many business models are only becoming feasible because of the design options enabled by the blockchain technology. A good example are the options related to the governance of organisation.

A decentralised autonomous organisation (DAO) is an entity owned and controlled by its members. There has been a lot of experimentation since the creation of the first DAO in 2016. DAOs can have various governance structures with diverse decision-making processes. It can also include features like granting tokens to beneficiaries and funders for voting purposes. The structure and approach of DAOs can evolve over time, with power distribution and decision-making authority typically becoming more decentralised as the organisation grows.

Big Green, an NGO focused on connecting children to healthy food, launched the Big Green DAO in 2021 to experiment with new approaches in philanthropy as outlined in the governance structure in Figure 3.

(7) Blockchain for good has been discussed by Giulio Coppi, "Introduction to Distributed Ledger Technologies for Social, Development, and Humanitarian Impact," in *Blockchain, Law and Governance* (Springer, 2021), 231–41; Hossein Baharmand, Amin Maghsoudi, and Giulio Coppi, "Exploring the Application of Blockchain to Humanitarian Supply Chains: Insights from Humanitarian Supply Blockchain Pilot Project," *International Journal of Operations & Production Management* 41, no. 9 (January 1, 2021): 1522–43, https://doi.org/10.1108/IJOPM-12-2020-0884; Elham Seyedsayamdost and Peter Vanderwal, "From Good Governance to Governance for Good: Blockchain for Social Impact," *Journal of International Development* 32, no. 6 (2020): 943–60, https://doi.org/10.1002/jid.3485.
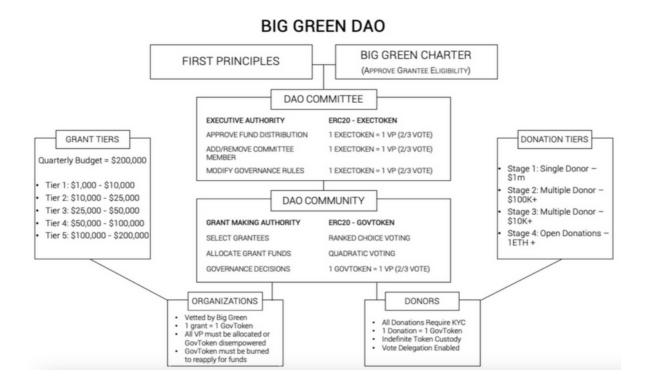
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Figure 3: Governance structure of a US-based DAO

Source: Big Green (2021)

4. Case Study - AndrΩn

AndrΩn is an Italian start-up set up by a partnership between the University of Messina(8) and FEBEA member Fondazione di Comunità di Messina that uses blockchain technology to create networks in the civil society based on transparency, trust, and fairness in transactions.

It was developed as an innovative take on the "time bank", a community-based system that facilitates the exchange of services or skills among members without the use of money. In a time bank, people earn "time credits" by providing a service to another member of the time bank, and they can use those credits to receive services from other members. The creators of AndrΩn aim at establishing a new local complementary token that is governed by a restricted number of institutions and has no speculative nature. In addition, it should be flexible enough to allow for the creation of additional use cases.

To achieve these objectives, AndrΩn utilises a public permissioned blockchain, where all transactions are verifiable by users or the general public. This increases the level of trust with and also makes the blockchain accessible by applications implementing different use cases. However, it keeps a level of control with the network to avoid activities that are not in line with the original mission.

The AndrΩn economy enables the creation of multiple use cases where participants can exchange voluntary activities over the platform. It involves stakeholders such as users, companies, and third-sector associations that interact with the ethical complementary currency. Users can donate time or receive discounts for goods and services, companies can offer discounts or purchase goods and services from other companies, and third-sector associations guarantee users working for the community and can purchase goods and services at discounted rates. This mechanism is outlined in Figure 4.

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(8) We would like to thank Prof. Francesco Longo, who presented AndrΩn during the training. Francesco Longo received his Ph.D. in Computer Engineering from the University of Messina, Italy, where he is currently an Associate Professor at the Department of Engineering. He is the author of more than 100 scientific papers in international journals and conferences. His main research interests include: analytical modelling and performance evaluation; reliability and availability of distributed systems; Grid and Cloud computing; Internet of Things and Fog/Edge computing and their applications in the context of Smart Cities; blockchain technologies and their use for IoT, Cloud, and Fog/Edge computing. He is one of the co-founder of SmartMe.IO Srl, an academic spinoff of the University of Messina focusing on transforming the advances of scientific research in the IoT field into solutions available on the market. He is a member of the scientific committee of the Horcynus Orca Foundation and of the Messina Evolved Social District.
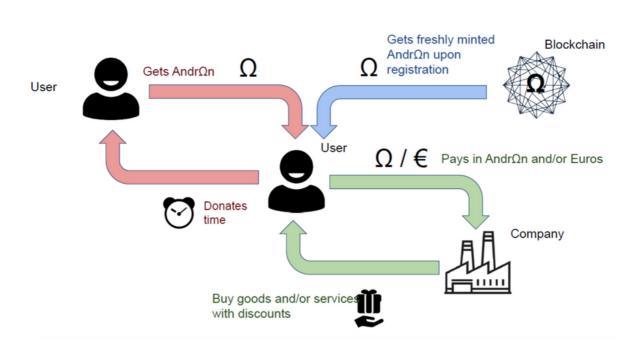
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Figure 4: Gift of time, goods and services
Source: AndrΩn

As an additional use case, there is AndrΩn Energy, a peer-to-peer energy community that focuses on sharing energy produced from renewable sources. The pricing algorithm accounts for social needs rather than just energy balance, and sharing is mediated by AndrΩn, linking to the ethical aspects of the currency.

The opportunities of blockchain technology can be illustrated again here. It is possible to maintain an immutable database of telemetry data containing information on energy production, consumption, and exchange. Moreover, pricing algorithms are implemented as smart contracts which can incorporate all requirements as needed. Bills can be partially paid in AndrΩn, making it a use case for the ethical complementary currency.

5. Outlook and next steps

It is evident that the potential of blockchain technology in enhancing the ethical banking industry and supporting social economy organisations exists. By providing transparency, privacy and a single trusted source of data, blockchain technology can be used by social finance intermediaries as well as social economy organisations.

However, there are concerns about speculative tendencies in cryptocurrencies, user-friendliness, and the need for innovation around easy-to-use and secure wallets.

As ethical banks focus on democratising finance and fostering inclusivity, it is essential to address the speculative nature of cryptocurrencies and minimise or eliminate speculative elements when deploying blockchain-based tools in the social economy.

While blockchain technology has the potential to increase transparency and accountability in the social economy, it may also lead to a reduction of trust as an unintended consequence. That is because blockchain technology removes the need for intermediaries which might lead to a lack of confidence in the system. Even more important for ethical financiers, who often build trust and a long-term and personal relationship with their clients, using an online tool reduces the social interactions between these actors, thus negatively impacting a key aspect of the social economy, that is, the personal relationships.

On the other hand, by removing intermediaries, blockchain technology can reduce transaction fees and increase the efficiency of the system. This can make social finance more accessible and affordable for everyone, including those who may not have had access to traditional financial services in the past.

Another challenge is related to the scalability of the technology. While blockchain technology has been successful in powering cryptocurrencies like Bitcoin, it may not be suitable for large-scale applications. As the number of transactions on the blockchain increases, the network may become congested and more expensive to use, which could limit its usefulness in the social economy. However, there are various initiatives which work on ways to scale the number of transactions per second.

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Furthermore, the decentralised and autonomous nature of blockchain technology is an attractive feature but also makes it difficult to regulate. This creates a risk of illegal activities being carried out on the blockchain. Therefore, it is important to develop a regulatory framework that balances the need for innovation with the need to protect consumers and prevent illegal activities.

However, social finance organisations must comply with a range of regulations related to anti-money laundering (AML), know-your-customer (KYC), and data privacy. Blockchain technology can make compliance more challenging because it is designed to be decentralised and anonymous. Therefore, social finance organisations must ensure that their blockchain systems comply with relevant regulations and that they are able to identify and mitigate any potential compliance risks.

Related to this, one of the main risks of blockchain technology for social finance is related to security. While the underlying blockchain technology is very secure and has not been hacked since its beginning, the ecosystem is still vulnerable to cyberattacks and other security breaches. If a social finance organisations system is compromised, it could result in the loss of investor funds and, perhaps even worse, damage to the organisation's reputation. Therefore, it is important for social finance organisations to implement robust security measures.

The industry has reduced its carbon footprint massively as one of the larger blockchains, Ethereum, has moved from Proof of Work (PoW) to Proof of Stake (PoS). However, the operation of the Bitcoin blockchain is still consuming large amounts of energy. It has been estimated that mining alone consumes as much energy as Finland or Washington State.

Finally, it should be noted that there is a risk that blockchain technology could exacerbate existing inequalities in the social finance sector. For example, blockchain-based fundraising platforms may favour projects with strong technical expertise or a large social media following, rather than those with the most significant social or environmental impact. Therefore, it is important for social finance organisations to ensure that the benefits of blockchain technology are distributed fairly and that everyone has the opportunity to benefit from its development and use.

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In conclusion, while blockchain technology has the potential to revolutionise the social economy, it also poses several challenges. Addressing these challenges will require a collaborative effort from all stakeholders, including policymakers, businesses, and civil society organisations. By working together, we can ensure that blockchain technology is used in a responsible and ethical manner that benefits everyone.

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FEBEA - the European Federation of Ethical and Alternative Banks and Financiers - is a non-profit association based in Brussels. It gathers 33 financial institutions whose aim is to finance social and solidarity economy (SSE) and projects with social, environmental and cultural value in 17 European countries, serving more than 700,000 people.

Its objective is to support the exchange of experiences and promote cooperation between social economy and social finance practitioners.

Each FEBEA member is integrated in the SSE Sector in its country, focusing on mobilising savings and equity from responsible citizens and using these funds to finance sustainable development and local communities. FEBEA is member of GECES, the European Commission's expert Group on Social Economy and Social Entrepreneurship and of Social Economy Europe, the main European network of social economy practitioners.

FEBEA members finance:
- The creation of jobs, social employment in particular;
- Social enterprises and social economy;
- The non-profit sector and participatory economics;
- New forms of social entrepreneurship
- People or groups of people who are victims of social or professional exclusion or are unbanked;
- Sustainable development: renewable sources of energy, organic farming, biodiversity, etc.;
- International solidarity and fair trade.