

New Financial Technologies for the Provision of Green Public Services

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Opinion

New financial technologies have great potential in financing the public-private collaboration and provision of public services, whether environmental or not, although at the moment its practical applications are rather scarce.

Every time an economic or financial crisis happens, the basic public services suffer cuts and, the efficiency of public finance gains more importance. During the crisis, public tax revenues fall, and banking credits prioritize the most solvent public bodies.

This article aims to outline the potential areas of application of new financial instruments for the provision of green public services. We provide brief characteristics of these financial instruments and outline the areas of their application in the provision of green public services.

Although blockchains have been traditionally used in cryptocurrency trading, they have a much wider range of potential applications. Blockchain or chain of blocks is a digital ledger in which a wide variety of operations can be registered, e.g., purchase, merchandise traceability, contracts, certificates, property registration, accounting, etc., as they are carried out. Blockchain is a distributed system, and each change must be accepted by all the nodes following a pre-established consensus protocol, and it is automatically synchronized in each node. After their acceptance, the changes made cannot be modified, so that blockchain acts as a digital notary. For all these reasons it is both fast and safe. Blockchains can be public (giving access to anyone) or private (with access restricted to a group of people). Smart contracts enable new forms of digital payments and provision of public services over Blockchains. The best-known blockchain platforms for cryptocurrencies are Bitcoin, Ethereum, and Waves.

A blockchain-based digital government can protect data, streamline processes, and reduce fraud and abuse, while simultaneously increasing trust and accountability. On a blockchain-based government model, individuals, businesses, and governments can share resources over a distributed ledger secured using cryptography. This structure eliminates a single point of failure and inherently protects sensitive citizen and government data. The World Economic Forum [1] initiated the Unlocking Government Transparency with Blockchain Project to reduce corruption and provide an effective mechanism in vendor selection in the public procurement process.

OECD [2] outlined a number of blockchain applications in the public sector across the world such as for public tenders, land registry transactions and ownership, interbank payments for cross-border monetary and government securities transactions, vehicle life-cycle ownership, and others. Other areas of prospective applications include public procurement, public health, pension infrastructure, social assistance to low-income citizens, voting, property registration, business licensing and banking and others, [3].

According to the Observatory of public sector innovations of the OECD (OPSI), there are currently at least 202 government blockchain initiatives in 45 countries around the world, mostly in the USA, Australia, Canada, China and Singapore, OPSI [4], however many of them are currently on a development stage.

There is substantial largely uncovered potential for blockchain application in sustainable finance. It is well known that climate markets often suffer from poor transparency and accountability, inefficient verification and non-additionality of carbon offsets,

and also of significant regulatory constraints, Broekhoff [5]. Using blockchains for carbon transactions and verification will greatly increase the efficiency and transparency of carbon markets, while lowering transaction costs. Blockchains can be used to record transactions and ownerships of emission trading systems.

A token is a unit of value or currency belonging to a public or private organization with or without profit, that the holder can exchange for products, services or other currencies, whether fiat (e.g., euros) or digital (e.g., Bitcoin cryptocurrency). Regional, municipal or national governments can issue green tokens to the individuals, enterprises and startups in order to incentivize or to reward environmentally friendly collective actions for which they lack funding. These tokens can be spent on purchasing of green products or donated to sustainable activities. Public requirements for green tokenization can provide additional transparency to the raw materials supply chains, covering the stages from raw materials extraction, conversion to the intermediate inputs or final goods through production processes with subsequent recycling, remanufacturing or reuse.

Initial Public Offering (IPO) and Initial Coin Offering (ICO) are the popular instruments for crowdfunding that constitute an alternative to more traditional sources of start-up funding such as venture capital and angel finance that are currently widely used by private companies and start-ups. IPO foresees a sale of shares when a project or a company is launched. Shareholders have decision-making power, proportionally to the number of their shares. IPOs may also be sold on the stock market.

ICO are used for the fundraising, by issuing digital tokens in exchange for crypto assets or fiat currencies. All supporting parties can buy tokens, without a minimum or maximum limit, through a blockchain platform and, in addition, they can obtain tokens for the use of the project, start-up, or company under the conditions set by the ICO promoter. It is open to any interested person, following the promoter's rules. There are no intermediaries. Once conditions are met by the buyer, through smart contracts, the tokens are automatically allocated. Said buyer is not a shareholder-owner and, therefore, does not make decisions in the management of the project or company. Being more regulated, IPOs are considered to be safer for the shareholders than ICOs.

Environmental, social and governance considerations throughout IPO registration documents required for companies that want to list on a U.S. public exchange, 17% reached in the third quarter of 2021 representing a ninefold increase in 18 months [6].

Currently there is a number of IPO and ICO applications to finance sustainable private services. Guzman et al [7] using an ICObench database that features 324 environmental ICO between 2017 and 2019 in different countries, have found that attention to global warming increases the total funding raised in an environmental ICO.

Undoubtedly, IPO and ICO can also be used by governmental agencies similarly to the civic crowdfunding projects that is employed by various tiers of government in different countries, but with greater security and transparency ensured by blockchain technology. Civic crowdfunding refers to direct civic funding or community projects initiated by local, federal or national governments, Lenart-Gansiniec R [8].

ICO or IPO issued by municipal, regional or national governments are likely to be more secure compared with those issued by private fundraisers. This model will permit the governments to directly borrow funds from the community, bypassing any kind of intermediaries in raising money.

Government participation can help increase trust in crowdfunding as well as increase public benefits from crowdfunding. Though ICO or IPO other types of public crowdfunding can be enabled, e.g., reward-based, donation-based or civic crowdfunding.

New financial technologies have great potential for fundraising in the provision of green public services, ensuring their transparency, accountability and integrity and recognition of environmentally friendly actions by citizens and private enterprises [9,10].

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