Blockchains,
a lever of digitization for investment banks

Éric Rossignol,
in charge of quantitative analysis and of Innovation Laboratory (Department Securitization at Crédit Agricole CIB),
&
Xavier Laurent,
member of the team Innovation and of the department Strategy & Business Transformation, and leader of the Blockchain Community (Crédit Agricole CIB)

Abstract:
Trust is the driving force in blockchain technology. Investment banks are designing many prototypes using this technology because their business heavily depends on the trust they bring to relations with customers. Till now, investment banks have seen this new technology as an opportunity for curbing costs and delivering a better service to customers rather than as a threat. After all, firms still need a supplier of liquidity at the best price…

Innovation used to be the privilege of upper white-collars. Colleagues usually had access to state-of-the-art equipment at work and could, at times, use it for the benefit of their households.[1] Digital technology spread, initially, through the general public, more open than firms to experiments with new uses (and the related risks). As the pace of the digitization slowed in the work environment, a feeling of frustration arose among employees.

Big firms, especially in industry, have information systems with strata that have been successively laid over a long period (sometimes dating back to the 1960s). This is a brake to innovation, for them; but it bestows a clear advantage on more agile small and medium-sized enterprises with more recent information systems. This especially turns to the advantage of fintechs — the start-ups in finance that are using this new technology — in comparison with the traditional banking system.

Given these trends, finance and investment banks must respond to customers' and clients' new expectations by improving their performance. They cannot do this without adopting the new technology and overhauling their processes. These banks should not, however, forget that they must guarantee their proposals for ensuring security. For clients and customers, risk control still makes a difference in the comparison with fintechs.

---

[1] This article has been translated from French by Noal Mellott (Omaha Beach, France).

Blockchains with distributed ledger technology (DLT) are an important means for coping with this situation. They can instill the requisite confidence in financial institutions, their customers, regulators and, too, the many other economic agents involved in exchanging information and digitally automating business in a safe, secure environment.

The inevitably vanishing trusted third party?

At the origin, Bitcoin intended to break with the conventional financial system (banks, including central banks) and propose a purely technological alternative to the trusted third party, who validates transfers with a monetary value. With no more than ten years for standing back to take a look at this phenomenon, we have to admit that banks are still playing this third-party role even as they undergo the digital transition. Bitcoins enable users (other than computer scientists) to do without banks; but it forces them to entrust their electronic wallets (where bitcoins are deposited) to a third party or to convert this cryptocurrency into a more widely accepted official currency. It is these new trusted third parties whom hackers usually catch up with and who are liable for the headline-catching thefts of cryptocurrencies.

As much can be said about attorneys, the experts who certify a contract's legality, its conformity with the law. Tomorrow, the services of a computer scientist or programmer will probably be needed to validate the full accordance of a smart contract with the law. It will then be necessary to "trust" the person in charge of writing the contract's code.

Let us take an example. LaZooz and Arcade City want to use blockchain technology to eliminate intermediaries such as Uber. These startups seek to bring drivers and riders into contact without going through a centralized platform that sets the price for rides. What they promise is, once again, evidence that a trusted third party is still needed. Although these new operators offer more flexibility and freedom to users, in particular for setting prices, they still provide access to a platform… and users accept to "trust" the platform and its technological toolkit.

Finance and investment banks generally do not accept the prevalent idea that blockchains will eliminate trusted third parties. They think, instead, that blockchains will redistribute this function over the chain of production by shifting value toward the technology and those in control of it.

The promised sharing of transparency?

Borne by the growth of the Internet, digital technology has been facilitating the digitization and acceleration of financial transactions. We have witnessed this trend in the gradual computerization of capital market operations during the 1980s and 1990s, the Internet's increasing connectivity and, since 2000, high-frequency trading. These revolutionary advances of a technology on the march have made markets grow, and made them more liquid.

One thing has not changed however: each party has its own view of the transaction to be undertaken. The reconciliation of this view with the views of the other parties requires effort. Notwithstanding that, all parties frequently share the same view, but with differences….that represent a risk. Finance and investment banks have to spend much energy and cover many costs in order to clarify these differences. Even when a trusted third party (such as a clearing house) intervenes, as in many such transactions, the risk remains. It hampers the efficiency of transactions, since payments in the euro market generally occur two days later. This risk entails a cost, since it has to be covered during this period.

For regulatory authorities, this situation is far from ideal. To fully play their role as controllers, they need to have an ever improved visibility of transactions. However they receive from each party to the transaction a partial view that they have to harmonize with the views of the other parties and with their own.

Distributed ledger technology is capable of changing paradigms. It imposes a single view, a reference shared by all parties and operators in the market. In this new paradigm, each party would have a view restricted to the transactions in which it is involved; but there should be no differences between parties. Furthermore, a global, exhaustive view would be granted to supervisory authorities, who could thus fully and efficiently play their role as controllers. Finally, payments could be made at the end of the day, or even more frequently.

New digital platforms

Through trade finance, a bank covers merchandise during the phase of transfer (or shipment) from seller to buyer, a phase involving many formalities (customs, storage, bills of lading, etc.). Till now, this activity has, in general, withstood attempts to digitize it. The basic principles laid down by the banks of Genoa or Venice in the Middle Ages still hold… having become more complicated and sophisticated over time. Paper documents still prevail, being passed from hand to hand, from signature to rubber stamp, up till their appraisal and recognition by an expert. The cost and time needed for all this paperwork are significant; but this is the price to pay so that the minium of confidence needed to exchange a value for a product (or service) across borders and boundaries can arise in dealings that involve so many private and public agents from various horizons.

Bankers still see their role as assisting importers and exporters as they trade, financing their needs for liquidity and covering (some) trade-related risks. Bankers are but a link in a chain that includes inspectors, insurers, transporters, customs officials, etc., who intervene to make trade safe and secure.

DLT is a way for these players to digitize the chain of their exchanges, as each of them adds his information there, having been guaranteed that no other party, not even the administrator, is able to corrupt the ledger. In turn, electronic signatures are needed for certifying the information for making engagements toward other parties on the chain. This guarantee arouses the confidence necessary for trade, for sharing information and digitally executing the transaction as a real transaction (*i.e.*, payment in exchange for property).

Firms might resort to platforms using blockchain technology to benefit either from a reduction of costs (in relation to the security provided by current procedures involving a trusted third party) or from an improvement in the security and traceability of transactions and payments (at a cost comparable with current costs). They might thus gain access to a marketplace for financial services and for the coverage of risks.

Securitization: A synopsis of DLT's advantages

The so-called "real economy" is massively financed through accounts receivable, *i.e.*, entries on a firm's balance sheet of the value of a service or product that has been provided but for which the customer has not yet paid. Firms often depend heavily on commercial debt. Since accounts receivable are not very standardized (with regard to the management of customer identifications, payments, disputes, etc.), the assets corresponding to them have low liquidity. Such an asset can be sold (via securitization, factoring or forfaiting) in order to obtain liquid assets, but the cost of selling them is high because it is necessary for the bank financing the sale:

● to know both the purchaser and seller;
● to be familiar with the procedures for debt collection and litigation between buyer and seller;

● to calculate the purchase price and have information on the price structure (if, for example, payment is deferred as a function of the performance of the purchased asset). Calculating the purchase price is either very simple but not very accurate (due to "adverse selection"), or else complicated and, in this case, a trusted third party is needed to validate it.

Accounts receivable are a likely candidate for entries on a blockchain. This would make it possible to:

● standardize the account receivable so as to make it as liquid as possible;

● easily monitor these accounts for all parties to the transaction;

● simplify the transfer procedure;

● curb structural costs by curtailing the role of intermediaries and trusted third parties;

● calculate in detail a purchase price as part of a smart contract, thus limiting the risks of adverse selection while maximizing the purchase price for the seller;

● optimize the frequency of payments. The current practice for securitization operations is to schedule monthly transfers. Thanks to DLT, transfers could be made daily.

Prototypes have been designed for creating an environment favorable to a simplified transfer of assets via a blockchain. One of them has demonstrated that a blockchain is capable of carrying a rather sophisticated smart contract for finely calculating the selling price without any trusted third party. The next step will be to persuade the participating companies to implement the full process. However several legal questions, still hanging, must be settled….

Hanging questions…

When Elon Musk was told that accelerating the Hyperloop (as initially designed) would probably kill passengers, he replied, *"Yes, it's an issue"* but did not give up. Nowadays, the fate of blockchain technology is hanging on more than a few unanswered questions.

"Scalability" is one of them. Cryptocurrency transactions must be capable of reaching the same volume as fiat currencies without impairing security procedures and processes. Some DLTs propose more efficient consensus methods, but the latter are advantageous only if the number of transactions remains limited.

Users' keys, both public and private, do not, by themselves, guarantee anonymity. Once transactions start taking place at a significant scale, patterns would, we suppose, appear that could be used to link a digital transaction on the blockchain to the "real" party making it. The Danish police has, more than once, come up with proof sufficient for sentencing persons accused of using bitcoins for money laundering.[2] An additional layer of security must be imagined for the anonymity and confidentiality of transactions.

---

[2] https://www.reddit.com/r/Bitcoin/comments/5vcvgj/first_arrests_made_from_blockchain_analysis/

Data management is another key factor. Open blockchains do not guarantee that the data stored on them are confidential, quite to the contrary! Should data that cannot be interpreted figure in smart contracts? Which data, if stored on a blockchain, would violate existing regulations? For which data should cryptographic procedures be foreseen so that only the parties concerned be able to decipher the information relevant to their transaction? Some forms of DLT have, very early in the course of development, incorporated procedures for answering these questions. We must be watchful to choose a specific form of this technology as a function of the planned-for use.

Conclusion

The promises of blockchain technology seem plausible but have not yet been realized. This technology has to mature and respond to the concerns aroused by it. The proof-of-work consensus has shown its limits (in particular, scalability); and its successors (proof-of-stake, the unsolvable Byzantine Generals' Problem or the highly promising Algorand public ledgers) have not yet proven their mettle. Only the continuation of experiments in cooperation with finance and investment banks, a cooperation broadened to include their clients and other parties in the value chain, will come up with a solution for the benefit of all stakeholders in these networks of a new type.