BLOCKCHAIN IN AVIATION FINANCE: GETTING READY FOR TAKEOFF?

11 NOVEMBER 2019 • ARTICLE

Welcome to the third in a series of WFW articles, exploring blockchain technology and its effectiveness across key industries. This article looks at the potential impact of blockchain on the aviation sector.

WHAT IS BLOCKCHAIN TECHNOLOGY?

Blockchain technology is often described as distributed ledger technology. It is "distributed" because the data, which is stored in a ledger, or chain of chronological blocks, is shared amongst a number of parties who each have a complete copy of the information, as opposed to the data being held by one centralised party as has traditionally been the case. All parties to the blockchain have to agree on new data entries ("**Consensus**"), and so there is always only one verified set of data.

The blockchain is secure and resistant to modification by design. Cryptographic algorithms validate how transactions are recorded in blocks, per the Consensus. This characteristic is critical as it enables the blockchain to replace trusted middlemen with computer code, which performs the same job with more certainty, with less scope for human error and fraud, all in a fraction of the usual time and for a fraction of the usual cost.

Some blockchain communities are open to the public, such as Bitcoin. However, given the sensitivity of data involved in aviation finance, the systems envisaged in this briefing are private "permissioned" networks, where a party wishing to join the community requires the consent of an entity or consortium acting as gatekeeper. This can enable different parties to have differing levels of access to data, as appropriate.

POTENTIAL APPLICATIONS

So, will aircraft be financed in cryptocurrency anytime soon? We don't envisage this happening as currently this would just replace airlines' foreign exchange risk with volatile cryptocurrency risk. However, there are four other instances where blockchain might revolutionise elements of the current aviation finance landscape:

1. The use of smart contracts in finance transactions;
2. Blockchain maintenance logs;
3. Implementation of a public registry for ownership and security interests; and

4. Implementation of a trading platform for debt and equity interests in aircraft.

THERE ARE MAJOR CHALLENGES TO INDUSTRY-WIDE ADOPTION OF BLOCKCHAIN TECHNOLOGIES BUT THE POTENTIAL OPPORTUNITIES ACHIEVED THROUGH A DISTRIBUTED LEDGER SYSTEM COULD BE SIGNIFICANT.

1. SMART CONTRACTS

Blockchain enables the use of so-called "smart contracts". These are contracts embedded in computer code that automatically facilitate, verify and execute/enforce the performance of an agreement when certain predefined conditions are met. Smart contracts replicate the structure of traditional contractual clauses, to make them partially or fully-self executing.

Many clauses in operating and finance leases are ripe for smart contract deployment. For instance, rent payments could be automated to leave a lessee's account on a set date of every month and financial data relating to covenants could be automatically sent to the lessor and analysed, in keeping with contractual arrangements. These developments would reduce time and cost involved in administering transactions, enabling financiers to compete more aggressively on fees in what is an incredibly competitive market.

However, as some clauses such as enforcement of security can be complex and require human judgment, we envisage a form of "hybrid" smart contract whereby many mechanical provisions are encoded, with those requiring more nuanced consideration written in natural language and requiring manual execution.

Previous efforts at digitalising trade finance payments have failed due to the lack of wide-spread adoption and this raises doubts about how successful new digitalisation efforts such as blockchain will be. Without industry wide adoption, the anticipated return on investment is unlikely to materialise. There are also issues around linking the blockchain to the banking system which might mean that payments could only be made in a cryptocurrency (with the associated exposure to volatile exchange rates), something the majority of market participants would be unwilling to accept at this time.

2. MAINTENANCE LOGS

Commercial aircraft can have a lifespan of up to 30 years, and the vast majority of airframe and engine maintenance records are still paper based. Not only does this create scope for loss of data and fraud, it also makes conducting due diligence far more painstaking than need be. An immutable blockchain record of an aircraft's history could ensure that parts are legitimate, automatically schedule servicing and provide a complete audit trail. This would expedite due diligence and increase safety as well as simplifying ongoing monitoring of compliance with technical covenants in lease and finance documentation such as those relating to installation of PMA parts. We are aware that Boeing and Airbus are already forging ahead with research and development in this field.

To be successful, a blockchain platform bringing transparency to the supply chain would need to be private and secure from outside parties. Only invited parties or nodes would be allowed to view the date on transactions for parties to be confident that proprietary information is not made public. This would likely require a governing body to determine who is allowed to participate on the blockchain.

3. PUBLIC REGISTRY OF OWNERSHIP AND SECURITY INTERESTS

Akin to the decentralised shipping container box registry envisaged in the first WFW blockchain article, blockchain technology could be deployed to create a decentralised registry for the ownership of airframes and engines and the registration of security interests, building on the role currently played by the International Registry of Mobile Assets.

Any network using blockchain technology as a formal and legally binding portal for recognition and registration of rights (whether ownership or mortgage rights), would have to be supported by amendments to international and domestic law, e.g. an amended Cape Town Convention. Without this, the blockchain would run a network sullied by lack of legal effect. Although the prospect of such legal reform may seem remote at this stage, as familiarity with blockchain technology grows, it is possible that a decentralised registry will develop to, for example, record transfers of title and changes of ownership.

However, maintaining the quality of information that is inputted to the blockchain would require a licensed inspector who might need to access the blockchain to see documents and integrate their certification information. A regulator or third party would also still be needed to define responsibilities, rules and regulations of participants despite blockchain widely being thought of as technology that would replace trusted intermediaries. In the current geo-political climate there must be reservations around the establishment of a global registration system on a blockchain.

4. TRADING PLATFORM

A smart contract-assisted forum through which parties could exchange equity and debt interests in aircraft would not require support from an international convention, making its adoption easier than a decentralised registry for ownership and security interests. The main barrier to adoption of a blockchain trading platform is the requirement for standardised contracts, which is not easy to achieve with complex assets such as aircraft. However, overcoming this obstacle would facilitate the creation of a blockchain trading platform where every participant in the private network would have passed anti-money laundering and sanctions checks thereby increasing trading liquidity, certainty and efficiency. There is some anecdotal proof of concept to be found in studies of agricultural commodity trading which have demonstrated a significant reduction on time spent processing documents and data. Whether similar savings could be expected from a comparable adoption in aviation would likely hinge on the willingness of market participants to forego bespoke contractual arrangements.

Any such blockchain database would also have to be very sensitive to tax implications of equity and debt transfers. As the transfer of ownership of aircraft in the wrong jurisdiction can result in significant transfer taxes, databases would have to reliably track aircraft locations to avoid adverse withholding tax consequences. The algorithms underpinning any such network would also have to verify that no such adverse effects would arise on transfers of debt.

CONCLUSION

There are major challenges to industry-wide adoption of blockchain technologies but the potential opportunities achieved through a distributed ledger system could be significant. Blockchain applications are, for example, already being used to simplify and revolutionise aircraft refuelling and this article has looked at only some of the possible ways in which blockchain may impact corporate and finance transactions in the aviation sector. The technology has the potential to revolutionise financing in due course by offering to reduce risk and expense.

In order for distributed ledger systems to proliferate, a majority of market participants will have to join communities and agree to standard transaction structures and terms. Legitimate concerns over who has access to what data will need to be resolved and the interests of certain parties in maintaining the status quo (because of they are able to charge large fees for acting as middlemen) will need to be overcome. Global standards and protocols will need to be established. In the current geo-political environment such an evolution in international cooperation would appear to be years in the making. In this case, it may well be that blockchain itself finds it has been disrupted by yet another new technology.