

## **Blockchains and International Business**

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### **Abstract:**

Discusses how blockchain is transforming international business practices and relationships. Blockchain and smart contracts are transforming international trade activities. Proof-of-concepts (PoCs), prototypes, pilot projects, and actual deployments indicate that smart contracts can bring benefits to those involved in trading.

**Keywords:** blockchain | international trade | project management | finance | smart contracts | government policies

### **Article:**

Blockchain and smart contracts are transforming international trade activities. Proof-of-concepts (PoCs), prototypes, pilot projects, and actual deployments indicate that smart contracts can bring benefits to those involved in trading.

As an example, in 2017, the multinational bank ING and French multinational investment bank and financial services company Societe Generale tested a blockchain-based trade finance prototype solution. The solution was called “easy trading connect”. The trial involved transactions between the two banks and Mercuria: a Swiss commodities trading corporation. An oil cargo shipment containing African crude sold to China's ChemChina was processed. The solution reportedly performed well in terms of criteria such as the elimination of documentary fraud, cost reduction, and improvement in efficiency. The trade involved the banks, traders, an agent, and an inspector (<http://www.businessinsider.com/ing-and-socgen-partner-on-blockchain-solution-2017-2>). All parties executed their roles directly on the platform. The prototype reduced the time taken by a bank to execute its role to 25 minutes, instead of the 3 hr taken earlier (<http://www.businessinsider.com/ing-and-socgen-partner-on-blockchain-solution-2017-2>). It led to a cost saving of up to 30% (<http://www.reuters.com/article/us-energy-companies-blockchain-idUSKBN16G1UU>).

Blockchain-based solutions, such as easy trading connect, thus help reduce the costs of international trade and increase speed and efficiency. In the above-mentioned example, the African crude oil producer ChemChina, as well as other players involved in the value chain of

oil, can benefit. The solution was also reported to perform well in terms of replicability. ING and Societe Generale were negotiating with traders in the liquefied natural gas industry to test the solution. Other developing economies engaged in commodities trades are thus likely to benefit from solutions such as this.

Blockchain makes it possible to keep a closer tab on key activities involved in international trades such as the flow of goods and documentation. In this way, this technology can help fight fraud.<sup>1</sup> Other key advantages of blockchain-based solutions in international trade activities include faster settlement of international payments, faster access to working capital financing at cheaper rates, and availability of one-stop solution for all needs related to international trades.<sup>2</sup>

## KEY MECHANISMS ASSOCIATED WITH BLOCKCHAIN'S ROLES IN FACILITATING INTERNATIONAL TRADE

Blockchain's impact on international trade key associated mechanisms is presented in Table 1.

**Table 1.** Some key mechanisms associated with blockchain's roles in facilitating international trade activities.

Mechanism	Blockchain's impact	Example
Increasing speed and efficiency	Based on slow paper-based procedures and a large number of physical interactions: Blockchain increases speed by digitizing	ICICI's blockchain pilot with Dubai's Emirates NBD bank: all parties of the transaction could access data in real-time. IBM's pilot test of the shipment of oranges from China to Singapore: relevant information was transmitted in one second
Reducing fraudulent transactions	Widespread fraud: Blockchain promotes transparency	MonetaGo: creates an invoice's hash—if a trader submits the same invoice to more than one trade finance platforms, the hash will match, which raises a red flag.
Increasing access to finance for international trade activities	The global trade finance gap is significant: Smart contracts and single digital records for customs clearance enable SMEs' access to trade finance.	OneConnect: can evaluate potential customers creditworthiness by extracting a wide range of company data
Reducing the costs of international trade	High costs of due diligence lead to high trade finance costs: Reduces the amount of documentation and manpower needed to process transactions	OneConnect: can evaluate potential customers creditworthiness at a low cost
Extensive paper work and physical interactions: Blockchain-based systems digitize them		Easy Trading Connect: cost saving of up to 30%.

## INCREASING SPEED AND EFFICIENCY

Blockchain solutions can greatly enhance speed and efficiency. Trade finance, which involves financing buyers and sellers, is a highly inefficient process. Due to the financial crisis, terrorist incidents, and other factors, banks are required to perform thorough due diligence and risk assessments of businesses that require trade finance.<sup>3</sup> According to the publishing and events company Global Trade Review, a trade finance deal for a single commodities cargo may require processing of as many as 36 original documents and 240 copies from up to 27 parties.<sup>4</sup> Trade

finance process in India can take up to 22 days. According to India's Yes Bank, blockchain platforms can reduce the time to less than a day (<https://www.bloomberg.com/news/articles/2018-06-06/banks-turn-to-blockchain-to-speed-up-indian-internal-trade-deals>).

In 2016, the Indian bank ICICI executed a blockchain pilot in partnership with Dubai's Emirates NBD bank (<https://www.cryptocoinsnews.com/indian-bank-icici-executes-blockchain-remittance-pilot/>). An international trade finance transaction enabled all parties of the transaction to access data in real-time. In the pilot, a Mumbai-based firm imported shredded steel melting scrap from a Dubai-based supplier (<https://www.cryptocoinsnews.com/indian-bank-icici-executes-blockchain-remittance-pilot/>).

In early 2019, IBM conducted a blockchain pilot test that involved the shipment of 28 tons of mandarin oranges from China to Singapore. All the relevant legal and commercial information such as title, ownership, and receipt of the shipment was transmitted in 1 s, which takes a week without blockchains. It involved multiple parties. The bill of lading, which functions as a contract between a freight carrier and shipper, a document of title, and a receipt of freight services, was sent in real-time. Pacific International Lines handled the shipment.<sup>5</sup>

## **REDUCING FRAUDULENT TRANSACTIONS**

A further benefit is that blockchain can reduce fraud. Trade transactions can be easily falsified in the nonblockchain world. For instance, some Chinese firms used fake receipts to secure multiple loans against a single cargo of metal.<sup>6</sup> Likewise, Ethiopian importers use fake invoices pay lower taxes on imported goods (<https://newbusinessethiopia.com/ethiopia-gets-1-6-billion-additional-revenue-capturing-fake-invoices/>).

Blockchain is an effective tool to fight these practices. The Chinese government has asked its banks to take measure to increase transparency and combat fraud in its financial sector by adopting blockchain. Chinese banks are hiring blockchain experts and incorporating blockchain in operations.<sup>7</sup>

India's central bank, the Reserve Bank of India, licensed three firms to facilitate small businesses' access to financing. These three platforms want to share information to prevent fraud but keep the data private. Blockchain can help this. Blockchain makes it possible to create a cryptographic representation of the invoice, known as a hash. A hash provides an indecipherable text and tells nothing about the invoice. It is nearly impossible to convert a hash back to the original data. If a trader submits the same invoice to more than one platform, the hash raises a red flag. New York-based MonetaGo hashes some of the elements of the invoice in order to prevent the trader from making some modification. An invoice with a high degree of similarity with another submitted to a different platform will not be rejected, but it will produce an amber flag. The platform may then ask the trader to explain (<https://www.ledgerinsights.com/monetago-blockchain-trade-finance-fraud/>).

It can be even more effective to combine blockchain with other technologies. The blockchain-based online trading platform for small and medium sized enterprises (SMEs), i.e.,

Connect2india, plans to connect trade partners, shipping companies, inspection agencies, and other participants in international trade. Its PoC uses GPS, IoT, RFID, and other technologies. These technologies can help inspection agencies to verify quality indicators such as steel grades and quality and types of agricultural products. GPS tracks the movement of goods and will help verify that transactions are real. The transaction data is stored on blockchains and integrated with smart contract and identity management (<https://www.expresscomputer.in/news/connect2india-to-use-blockchain-combined-with-gps-rfid-and-gps-to-nab-international-trade-fraud/32885/>).

## **INCREASING ACCESS TO FINANCE FOR INTERNATIONAL TRADE ACTIVITIES**

According to the Asian Development Bank, the global trade finance gap was US\$1.5 trillion, (<https://www.weforum.org/press/2018/09/blockchain-could-enable-1-trillion-in-trade-mostly-for-smes-and-emerging-markets/>). The gap can be partly attributed to the complexity of the traditional supply chain lending model. For instance, the first level suppliers (the suppliers to the buyer) need to contact lenders for a loan. They use the loan money to make payment to second level suppliers (suppliers to the first-level suppliers) or to third-level suppliers. In some cases, the number of suppliers in advanced supply chains can be as deep as 13 layers. The funds thus may take many weeks to reach the actual manufacturer (<https://www.coindesk.com/legally-binding-smart-contracts-9-law-firms-join-enterprise-ethereum-alliance/>).

Banks are not willing to lend money in places where fraudulent invoices are common. Several efforts have been made to address these challenges. In 2018, the People's Bank of China started to pilot trade finance project referred to as the “Bay Area Trade Finance Blockchain Platform.” Targeted jurisdictions include Guangdong, Hong Kong, and Macau. The participants include Bank of China, China Construction Bank, China Merchants Bank, Ping An Bank, and Standard Chartered Bank, and the auto manufacturer BYD. The majority of BYD's suppliers are SMEs, which include 10 000–20 000 tier one suppliers and even higher numbers of tier two and three suppliers. Data sharing among banks prohibits a firm from submitting the same invoice to two banks for funding. An invoice is authenticated by BYD provides credibility for banks.

## **RECUSING THE COSTS OF INTERNATIONAL TRADE**

Currently, the high costs of financing prohibit the participation of small firms in international trade. These can be often attributed to high costs of due diligence. Loan frauds result in high interest rates (<https://www.nasdaq.com/article/why-india-can-become-the-global-center-for-blockchain-innovation-cm992358>).

Blockchain-led transparency may help reduce these undesirable practices. In 2017, the Hong Kong Monetary Authority (HKMA) teamed up with the professional services group Deloitte and banks to develop a PoC for the blockchain-based platform for trade finance (<https://www.hellenicshippingnews.com/unblocking-blockchain-for-shipping/>). Participating banks include HSBC and Standard Chartered Bank, Bank of East Asia, Australia and New Zealand Banking Group Limited, Hang Seng Bank, and DBS Bank.<sup>8</sup>

The platform aims to reduce risks and increase efficiency by digitizing trade documents and automating trade finance processes. Among the key benefits are lower risks related to fraudulent

activities and higher transparency

(<https://www.scmp.com/business/companies/article/2155683/hkma-and-seven-banks-jointly-launch-blockchain-based-trade>).

The HKMA was reported to be working with Ping An to cut paperwork and reduce fraud (<https://www.ft.com/content/f2cacb86-85a3-11e8-96dd-fa565ec55929>). OneConnect, Ping An Group's financial technology company, designed the platform. The technologies had already been deployed in China (<https://www.crunchbase.com/organization/oneconnect#section-overview>).

Another key challenge concerns the high costs associated with paperwork and other administrative procedures. Companies involved in exports must complete mountains of paperwork. In 2014, The Danish shipping company Maersk tracked a shipment of avocados and roses from East Africa to Europe. A single container to handle a simple shipment of refrigerated goods required stamps and approvals from up to 30 people such as those in customs, tax officials, and health authorities. That included over 200 different interactions and communications (<https://www.forbes.com/sites/tomgroenfeldt/2017/03/05/ibm-and-maersk-apply-blockchain-to-container-shipping/>).

Blockchain-based solutions can drastically reduce paperwork. In August 2018, Maersk and IBM announced that the two companies jointly developed a blockchain-powered shipping solution TradeLens (<https://www.tradelens.com/>). The goals of TradeLens are to bring various parties involved in international trade together, support information sharing among them, and enhance transparency. The platform provides a single digital space to unite all relevant participants. As of October 2018, TradeLens had 94 participants that were actively involved or had agreed to be a part of the solution (<https://venturebeat.com/2018/08/09/ibm-and-maersk-launch-blockchain-to-reduce-shipping-time-and-costs/>). As of February 2019, over 100 financial entities were reported to have shown interest in TradeLens.<sup>9</sup>

## **SOME CONSTRAINTS IN IMPLEMENTING BLOCKCHAIN IN INTERNATIONAL BUSINESS**

There are a number of barriers in the adoption of blockchain in international trade. One limitation has been the lack of standards. The existence of multiple blockchain implementations that are noninteroperable creates a barrier for a large-scale deployment of the technology. This could lead to a fragmented ecosystem, which will limit the widespread adoption of the technology. For instance, a blockchain-based trade finance service needs to have data standard and protocol in order to share and use data among multiple participants. This situation is further complicated by the fact that buyers, sellers, third parties, intermediaries, and other participants create dates in different formats. The lack of blockchain standards makes it difficult to integrate these diverse sources of data in order to adopt blockchain-based smart contracts (<https://www.finextra.com/blogposting/13111/applying-blockchain-technology-to-trade-finance>).

Another key challenge facing blockchain deployment in international trade concerns the lack of legal recognition of blockchain transactions in some jurisdictions. There are also jurisdictional differences in legal principles governing such transactions.<sup>10</sup> For instance, regulations have been

laid down by the Chinese government to control blockchains. A new regulation that became effective on February 15, 2019, requires blockchain users to provide real names as well as national ID card numbers, mobile phones, or company registration to use blockchain services. Moreover, law enforcement must be able to get access to data whenever it is necessary (<https://www.theverge.com/2018/10/22/18008640/china-blockchain-registration-government-id>). This requirement creates special problems for cross border enterprise blockchains with nodes in China such as those involved in trade finance and international shipping. A Chinese party is required to accept supervisions by government authorities. The Chinese node, however, can host other encrypted transactions that may not be related to a Chinese party (<https://www.ledgerinsights.com/china-blockchain-regulations-identity-censorship/>).

Third, the incorporation of blockchain may require a drastic change in companies' business models. They may not have control over their data. They are required to share data with business partners and competitors. They also need to devote significant resources to understand the technology and its impact on day-to-day operations.

Finally, the lack of awareness of blockchain among key stakeholders has been a concern. For blockchain-based trade finance, regulators in Europe were reported to be knowledgeable on blockchain, and they were interested in innovation (<https://www.coindesk.com/blockchain-trade-finance-breaking-proof-concept-gridlock/>). The same cannot be said of regulators in developing economies. For instance, the main barrier to introduce blockchain in the Republic of Georgia has been educational rather than technical (<http://www.econotimes.com/Blockchain-startup-Humaniq-announces-alpha-release-of-mobile-app-607802>).

## **SUMMARY**

Blockchain-based solutions can increase efficiency for all participants involved in international trade. SMEs can have easy access to trade finance. Blockchain-based solutions can also bring many benefits to governments. For instance, traders in some countries are reported to use fake invoices to minimize taxes. Government agencies can be part of the blockchain-based decentralized system. Such systems can thus help minimize tax losses.

A broader participation of a wide range of stakeholders is critical to reap the full benefits. Examples such as the HKMA's collaboration with local banks indicate that regulators are bringing the banks together to develop blockchain-based solutions. A more likely possibility in the early stage is that some participants may lack the ability or willingness to adopt blockchain. Over time, positive network effects can arise when the utility of using blockchain becomes higher with an increase in the number of users.

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