TECH4TRADE: INNOVATIONS IN TRADE FINANCE AND IMPLICATIONS FOR SRI LANKA

Anushka Wijesinha
Economist specializing in trade, competitiveness and innovation

Introduction

Trade finance represents the financial instruments and products that are used by companies to facilitate international trade and commerce, making it easier for importers and exporters to transact international business. The function of it is to introduce a third-party to trade transactions to remove payment and supply risks. From exporters and importers to banks, shippers, truckers and custom agents, all economic agents in international trade transactions require checks and verifications at various points along the chain. Each interlocking part of the chain depends on successful completion of the previous phase and on reliable information.

The roots of trade finance have been traced back to Mesopotamia, where its story nourished primarily as a regional activity around active trade routes of the time during almost three millennia.[1] Researchers have come across trade finance on Babylonian clay tablets that are dated around 3000 BC, constituting examples of promissory notes and letters of credit.[2] However, with the fall of the Roman Empire in the 3rd Century AD, it went into somewhat of a long hibernation until the 15th Century. Around that time, it started its second phase led mainly by some European banks and financial institutions. This second phase however has been so rapid and widespread that some of the banks have opened their first branches in some key international trading points before having done so in their countries of origin[3].

Today, the global trade finance market is valued at US$ 59.5 Billion (2018) and is expected to reach US$ 71 Billion by the end of 2024. It is set to grow at a CAGR of 3.0 per cent during this period[4].

Trade financing is different from conventional financing or credit issuance. While general financing is used to manage solvency or liquidity, trade financing may not necessarily indicate a buyer's lack of funds or liquidity. Instead, trade finance may be used to protect against

[1] http://www.tim.org.tr/en/a-brief-story-of-trade-finance.html
[2] http://www.tim.org.tr/en/a-brief-story-of-trade-finance.html
[3] http://www.tim.org.tr/en/a-brief-story-of-trade-finance.html
[4] https://www.reuters.com/brandfeatures/venture-capital/article?id=88263

international trade's unique inherent risks, such as currency fluctuations, political instability, issues of non-payment, or the creditworthiness of one of the parties involved. Banks play a large role in the trade finance chain, notably in the supply of letters of credit. Buyers and suppliers use a letter of credit typically concluded by physically transferring paper documents to support transactions. This process however creates a long paper trail and may take between five and ten days to exchange documents.

More recently the mechanisms of trade finance have evolved, creating a pathway for more technologically innovative instruments such as smart contracts, robo-advisors, cryptocurrency, blockchain, cross-border remittance apps, Reg Tech and Insur Tech.[5] As stated in the ICC Banking Commission Report 2017, 'It has become clear that FinTech, and the digitization of trade-based finance are no longer just phrases or buzzwords'[6]. FinTech solutions could potentially solve some of the transparency and risk- related processes and transaction costs associated with banks' due diligence checks by providing trusted platforms to connect seekers and providers of funding.

Challenges of Trade Finance

The biggest challenge of trade finance is getting access to it. Since the global financial crisis of 2008, international banks have been reducing the size of their networks, leading to negative consequences for the smallest traders and poorest countries, who find it hardest to access trade finance. Tightened regulations, enhanced financial controls, increasing compliance costs and the inherent risks involved in cross-border trade, coupled with an ever-changing landscape of regulations, has impacted trade finance activities, including correspondent banking relationships.

Trade finance represents one of the three factors that hinder exports, affecting the possibility of linking or moving up the value chain and operating in the global markets[7]. The global trade finance gap is now estimated to be US$ 1.5 trillion per annum, with a staggering 60 per cent of trade finance requests from small businesses refused by banks, significantly hampering the opportunities for small businesses to trade.[8]

Businesses around the world, particularly SMEs, cite a lack of access to trade finance as a major barrier to their capacity to expand and intensify their international trade activities. SMEs are the backbone of the global economy, representing around 95 per cent of the world's companies and 60 per cent of private sector jobs, and play a great role in promoting employment and social cohesion. The supply or shortage of trade finance hurts SMEs the most, and thus has negative implications for inclusive growth[9]. Firm-level surveys by the International Monetary Fund (2016), World Bank (2015), and the Association of Supervisors of Banks of the Americas (2015) indicate that SMEs in countries in Africa, the Caribbean, Central Asia and Europe have been plagued by the lack of trade finance the most.

[5] https://www.weforum.org/agenda/2017/10/trade-finance-what-to-know/
[6] https://cdn.iccwbo.org/content/uploads/sites/3/2017/06/2017-rethinking-trade-finance.pdf
[7] https://www.weforum.org/agenda/2017/10/trade-finance-what-to-know/
[8] https://www.wto.org/english/res_e/statis_e/wts2018_e/wts2018_e.pdf
[9] https://iccwbo.org/global-issues-trends/banking-finance/access-trade-finance/

Technology as a solution

Today, trade finance remains largely paper based, manual and inefficient, requiring technological solutions that solve these problems and remove pain points. There are an estimated four billion pages of credit documentation in global trade finance today[10], resulting in most advances in trade finance technology focusing on digitizing key trade documentation like invoices, bills of lading, certificates of origin and airway bills, with the intention of introducing faster and more efficient verification of compliance with customs and international trade regulations. There is a new wave of technology expected to positively disrupt trade finance through a variety of ways, including artificial intelligence, machine learning automation and distributed ledger technologies like blockchain - one of the most promising technologies expected to revolutionize trade finance.

Blockchain as the future of trade finance?

Trade finance is currently full of inefficiencies and the industry is extremely vulnerable to fraud. The transactions rely heavily on long paper trails connecting multiple parties in the trade transaction that act as key verification points in the supply chain. The exchange of documents throughout the supply chain takes about five to ten days, if not longer, as manual verification is required. Parties are dispersed across the globe and operate on multiple platforms resulting in miscommunication and delays, causing ripple effects where finance disbursement and the delivery of physical goods is delayed. Every inspection of goods and every stop along the supply chain costs time and drives up prices, harming both businesses and consumers alike. More serious problems could arise in the event of fraud, where the same batch of goods is financed multiple times by banks who do not share the same information and or where certain trade documents are faked to obtain financing. Therefore, paper processes need to be replaced and blockchain technology can play a vital role in this transformation.

Blockchain technology creates an indelible audit trail that provides improved traceability, a benefit of blockchain that contributes to reduced compliance costs and eliminates the risk of manipulation by parties in the chain.[11] All legal, financial and product related information can be made available, allowing even the least trusting parties to comfortably conduct business. Concerns about reduced barriers at the borders and trade agreements increasing the risk of illicit trade can be addressed by blockchain through the provision of a system of authorized participants with high levels of transparency about the product, the party selling it or the path it takes to reach the buyer. Every party or item moved through the blockchain-backed channel can be traced, validated or rejected, ensuring trade malpractices and fraudulent behavior can be mitigated. Immutable records on the source of the raw material to where and how the products were manufactured, their distribution, maintenance, repair, recall and recycling histories, along with information about ownership, authenticity and price can all be held in the blockchain network. This information can help customs authorities decide what goods to let

[10] https://tradeix.com/benefits-of-blockchain-in-trade-finance/
[11] https://tradeix.com/benefits-of-blockchain-in-trade-finance/

through the border and what to block, thereby optimizing customs clearance.[12] It is estimated that blockchain could increase global trade volumes by US $1.1 trillion and increase the global banking industry's annual revenue from documentary trade financing by US$ 2 billion by 2026.[13]

Despite the benefits of blockchain, it is yet to be widely adopted by most parties engaged in trade finance. The Global Fintech Survey carried out by PWC states that approximately 40 per cent of banks surveyed were either slightly familiar or not familiar at all with the technology and less than 5 per cent of respondents were extremely familiar with blockchain.[14]

However, several banks, financial institutions and tech companies have formed partnerships in an attempt to develop and implement blockchain networks and shift trade finance on to blockchain technology. These partnerships are proof of how bankers see trade finance as an area with significant potential to benefit from the application of blockchain technology. Barclays reported the first blockchain based trade finance deal that covered US $100,000 worth of cheese and butter between Irish agricultural food cooperative Ornua and the Seychelles Trading Company. A 10-day process covering the issue and approval of the letter of credit was reduced to less than 4 hours, a significant improvement in a typical pain point in the trade finance process.[15]

The next section of this article highlights some applications of blockchain being implemented today.

Marco Polo

Marco Polo is an end to end trade finance network for banks and their corporate clients launched in 2017 that facilitates trade finance directly between parties and increase efficiency in the market. Over a dozen of the world's foremost financial institutions including BNP Paribas, Commerzbank, ING, Royal Bank of Scotland, Standard Chartered, together with Fintech companies like TradeIX and R3 have contributed to this platform.[16] The objective of the network is to facilitate interaction and create value for all participants through the combination of distributed ledger technology and trade and supply chain finance expertise, all brought under one shared and connected network.[17] Liquidity is a shared problem by corporates and SMEs worldwide, one that is particularly faced to a greater magnitude by SMEs which often leads to reduced growth prospects. Marco Polo recognises this increased need for liquidity and identifies the potential in funders looking to offer trade finance and companies that require finance solutions.

The Marco Polo Network is the first distributed trade finance platform which is run by all users and connected to all participants with the aid of a distributed ledger-based network. It allows each member to build solutions, control their data and eliminate points of failure while

[12] https://www.weforum.org/agenda/2017/02/blockchain-trade-trust-transparency
[13] https://www.bain.com/insights/rebooting-a-digital-solution-to-trade-finance/
[14] https://www.weforum.org/agenda/2017/02/blockchain-trade-trust-transparency
[15] https://www.weforum.org/agenda/2017/02/blockchain-trade-trust-transparency
[16] https://www.marcopolo.finance/about/
[17] https://www.marcopolo.finance/objectives/

providing optimum connectivity and the ability to share data in real time.[18] Banks and their clients face difficulties in the process of having to connect to separate platforms to access different types of trade finance solutions but the network connects a pool of trade finance solutions that are accessible in one single platform. Solutions can be accessed through web portals, on premise and cloud-based platforms as well as ERP embedded applications.[19] In the early stages, the network focused on three distinct areas of trade finance; risk mitigation by the provision of payment commitments, payables finance and receivables finance. The project has provided an effective solution for post shipment trade financing and pilot operations have commenced to expand the network to include additional banks, third party service providers such as Enterprise Resource Planning, credit insurers and logistics firms to create a fully interoperable open sourced trade finance network. [20]

We. Trade

In 2017 some of Europe's biggest banks, in collaboration with IBM, formed a consortium with KBC's block chain prototype to promote SME participation in global trade. The goal of the collaboration was to develop and commercialize the Digital Trade Chain (DTC), a cross border trade finance platform based on distributed ledger technology. In 2018, a legal entity under the name We. Trade was created for the expansion of the DTC platform, a joint venture between 12 leading European banks; HSBC, KBC, Natixis, Deutsche Bank, Nordea, Santander, Société Générale, Rabobank, UBS, CaixaBank, Erste Group and Unicredit.[21] The project initially covered eleven countries including the Netherlands, Norway, Spain, Belgium, Finland, Italy, France, Germany, Denmark, the United Kingdom and Sweden, followed by the merging of the Batavia Platform which went on to cover Austria and Switzerland. The network is expected to expand and include other countries in Europe and outside the continent.[22] Currently, the platform depends on logistic companies to be its key participants, with expectations to include port authorities and national customs departments in the near future.

Powered by the Hyperledger Fabric blockchain framework, the network was designed for tracking, managing and protecting trade transactions amongst SMEs. It connects all partners of the trade deal on a single platform, online and via mobile devices and is expected to contribute greatly to the increase in new trading partnerships initiated by SMEs and give them better access to trade finance solutions.

The We. Trade app documents every stage of the trading process, from point of order to shipment and payment, with information being displayed in the form of a flowchart for easier understanding. It brings in logistic companies using track and trace technology to verify the

[19] https://www.marcopolo.finance/objectives/
[19] https://www.marcopolo.finance/solutions/
[20] https://www.marcopolo.finance/leading-global-banks-together-with-tradeix-and-r3-pilot-blockchain-trade- finance-solution/
[21] https://www.ibm.com/case-studies/wetrade-blockchain-fintech-trade-finance
[22] https://www.gtreview.com/news/fintech/we-trade-and-batavia-merge-blockchain-platforms-for-trade-finance/

arrival of goods in agreed condition at key points in the journey that then triggers payment automatically. The platform is fully automated and is available 24/7, making the payment chain shorter and more effective than the traditional document exchange process. The DTC platform only allows participants who have undergone know-your-customer (KYC) and anti-money laundering (AML) checks to ensure a more secure platform.[23]

Batavia Platform

Built on the IBM Blockchain Platform, Batavia was developed in collaboration with UBS, Bank of Montreal, CaixaBank, Commerzbank, Erste Group and IBM, in consultation with transportation industry experts and banks' customers. The platform operates as an open ecosystem, accessible to organisations both big and small, and aims to simplify the trade finance process by moving away from traditional paper-based processes. Pilot transactions were conducted on the Batavia Platform with a variety of transportation modes, across different geographical locations, with a diversified range of trading partners, providing proof that the platform has the ability to scale and manage diverse transactions.[24] The pilot transactions included two imports to Spain: cars from Germany and textiles from Austria. During this stage, the participants were able to monitor each stage of the transaction as the goods travelled by road and sea. The latest version of the platform supports trade finance for transactions across all modes of trade including goods transported by air, land or sea.[25]

The Batavia platform is designed to support more efficient, transparent, secure and cost-effective transactions by digitizing and automating the arranging, securing and financing of international trade transactions. A single, distributed version of all documentation is shared across the network, providing all participants access to the same information needed to complete the transaction. At the close of the trade agreement, smart payments, automatically triggered by specified events in the supply chain, will be made to the respective parties and immutably recorded in the blockchain.[26] Batavia has digitized and sped up the process of obtaining a letter of credit, which usually takes 10-14 days, to under one hour.[27]

The Batavia Platform and We.Trade have merged their blockchain platforms, both built by IBM and powered by Hyperledger Fabric technology, with the expectations of building and strengthening a broader ecosystem for trade finance.[28]

Corda and Voltron

In 2016, banking consortium R3CEV reported that 15 of its members had joined a trade finance trial to test its distributed ledger technology named Corda. It is an open source platform

[23] https://medium.com/hashreader/trade-finance-an-introduction-to-the-key-challenges-8f6545771b87
[24] https://www.ibm.com/blogs/blockchain/2018/04/blockchain-based-batavia-platform-set-to-rewire-global-trade-finance/
[25] https://www.gtreview.com/news/fintech/ibm-batavia-blockchain-platform-global-trade/
[26] https://www.ibm.com/blogs/blockchain/2018/04/blockchain-based-batavia-platform-set-to-rewire-global-trade-finance/
[27] https://www.gtreview.com/news/fintech/ibm-batavia-blockchain-platform-global-trade/
[28] https://www.gtreview.com/news/fintech/we-trade-and-batavia-merge-blockchain-platforms-for-trade-finance/

that allows businesses to transact directly and in strict privacy using smart contracts, reducing transaction costs and streamlining business operations.[29] Voltron is a letter of credit application, business network and consortium built on Corda's blockchain platform. It aims at developing industry utility to provide a digital, end to end and simplified documentary trade solution for banks and corporates. Voltron's founding members, Standard Chartered, Bangkok Bank, BNP Paribas, CTBC Holding, HSBC, ING, NatWest and SEB have conducted pilot transactions in different industries including metals, wool, soybeans and plastics. Standard Chartered pilot involved the shipment of an oil product from Thailand to Singapore, involving oil and gas companies PTT Group, PTT International Trading and IRPC Public Company, in which the exchange of information between parties happen digitally on Voltron. The issuance, advising and negotiation of the letter of credit and presentation of documentation were all done on the platform, with all participants having real time updates on the transaction. The processing time, which generally takes days to complete, was significantly reduced to less than 12 hours.

The Voltron platform is looking to include more players and carried out a 6-week trial earlier this year with approximately 50 banks and corporates. Plans to expand Voltron to more than just a letter of credit application exists, with the platform enhancing the programme through customer feedback as it prepares for commercialization.[30]

The HSBC Trade Platform

HSBC India and ING Bank Brussels introduced a blockchain platform integrated with Bolero's Bill of Lading platform to issue and manage an electronic bill of lading, allowing the digital transfer of the title of goods from seller to buyer. The letter of credit was issued by ING for Tricon Energy USA, the importer, with HSBC India as the negotiating bank for Reliance Industries India, the exporting party, with the seven to 10-day documentation process being completed within a day.[31]

Another letter of credit transaction facilitating the bulk shipment of soybeans for international food conglomerate Cargill was executed by HSBC and ING using the platform. The transaction involved the shipment of soybeans from Argentina, through Cargill Geneva, to Malaysia, through Cargill's Singapore subsidiary as the purchaser. The two banks acted on behalf of the Cargill entities with the letter of credit being issued using the blockchain platform by HSBC to ING. Paper based documentation related to obtaining a letter of credit which is usually a five to 10-day process, was done in 24 hours, highlighting a key benefit of blockchain technology in trade finance digitisation.[32]

eTradeConnect Hong Kong

Facilitated by the Hong Kong Monetary Authority, HSBC, Standard Chartered and ten other banks launched a blockchain based trade finance platform to boost efficiency in the funding of

[29] https://www.r3.com/wp-content/uploads/2019/05/CordaEnterprise_FS_May2019.pdf
[30] https://www.gtreview.com/news/fintech/voltron-blockchain-solution-nears-production-as-standard-chartered-starts-piloting/
[31] https://www.finextra.com/pressarticle/76237/hsbc-and-ing-carry-out-blockchain-trade-finance-transaction
[32] https://www.hsbc.com/media/media-releases/2018/hsbc-trade-blockchain-transaction-press-release

international trade. The platform reduces the time taken for the granting of loan applications to four hours, a process that generally takes around one and a half days. The distributed ledger technology based platform aims to ensure trade and trade financing is carried out in an effective and cost efficient way. The first transaction on eTrade was the purchase of supplies by furniture and household goods retailer Pricerite, earning praise from the Chairman of Pricerite, Mr. Bankee Kwan, who stated that the cumbersome and complex process was transformed into a simpler but more secure and efficient way of conducting trade.[33]

eTradeConnect's next milestone is the linking of the platform with other platforms from different regions in order to enable cross border trade financing. They have partnered with We.Trade, a connection that will pave the way for the digitalisation of cross border trade between Asia and Europe and serve as a reference for the connection of the eTrade platform with other trade networks.[34]

Blockchain technology has not only been adopted by banks in the trade finance industry but has also been embraced by shipping firms. In 2017, shipping giant Maersk partnered with Microsoft and EY to form a joint venture to apply blockchain technology in the field of maritime insurance. The aim was to enable companies to comply with insurance requirements and to enable more accurate pricing of risks. Maersk has also expanded its work on distributed ledger technology and has partnered with IBM and third-party logistics provider Agility, to facilitate risk analysis and accelerate the time it takes for shipments to clear inspection.[35]

In addition to blockchain, artificial intelligence solutions also have potential to transform the trade finance industry.

Artificial Intelligence in Trade Finance

Artificial intelligence (AI) and machine learning (ML) show great potential in revolutionizing trade and trade finance. These technologies are good at completing processes that humans perform poorly, processes that are complicated and demand constant attention to detail.

The first applications of AI in the trade finance sector are fairly recent with the focus mainly being on compliance and due diligence. For example, natural language processing (NLP) being used to create comprehensive profiles of individuals or organisations involved in a transaction based on web searches or applications being developed to find anomalies in trade finance documents. The full extent of AI's capabilities in improving trade finance processes and its merits are yet to be discovered, as application is still in its early stages and only a handful of solutions have been introduced in the trade finance sector. A few solutions based on artificial

[33] https://www.reuters.com/article/us-hongkong-blockchain/hsbc-stanchart-others-launch-hk-blockchain-trade-finance-platform-idUSKCN1N51F0

[34] https://www.hkma.gov.hk/eng/key-information/press-releases/2018/20181031-4.shtml

[35] https://www.aig.co.uk/insights/tech-innovations-transform-trade-finance-and-risk

intelligence and machine learning are in the process of development and testing and some examples, based on publicly available information, are discussed blow.

Citi's AI based Risk Analytics Scoring Engine

Citi Bank has harnessed artificial intelligence technology to create an AI-based risk analytics scoring engine, in collaboration with EY and SAS that assists decision makers in reviewing trade transactions. The NextGen project was created to streamline highly manual processes associated with reviewing high volumes of global trade transactions while ensuring regulatory compliance. The platform aims to provide an in-depth analysis of global trade transactions to help align the bank's resources and use advanced analytics and natural language processing to better understand networks, unstructured data and customer activity. The bank hopes to achieve better risk posture, improved response times for monitoring and reduced operational costs through the use of the NextGen platform.[36]

Commerzbank Machine Learning-based Trade Compliance Solution

Germany's Commerzbank has plans to apply machine learning technology from Compend, an Amsterdam based fintech company, to trade finance compliance with the idea of automating around 80 per cent of the selected compliance relevant checks of the bank's trade finance processes by 2020. Optical Character Technology (OCR) and progressive learning is used to extract data from physical documents, recognise patterns and flag deviations. Application Programming Interfaces (APIs) connect Commerzbank's existing trade finance processing infrastructure, creating a detailed audit trail for regulatory reporting.[37]

Trade Finance Cognitive Automation Solution by LTI

Larsen & Toubro Infotech Limited, a global IT solutions and services company introduced a Trade Finance Cognitive Automation solution that eases and speeds up documentation verifications. This solution helps in cognitive OCR extraction of trade finance product related information from unstructured documents. Document handling is made simpler and more convenient with granular process visibility, real time alerts and reporting dashboards, while the screening and validation process of entities for automated compliance checks is also enabled by this solution. It leverages prebuilt dictionaries and vocabularies of the bank for sanctions screening and adapts to new information with the use of NLP and continuous learning, with comprehensive and continuous learning bringing consistency to the process.[38]

[36] https://ctmfile.com/story/citi-harness-ai-for-trade-finance-compliance
[37] https://www.finextra.com/newsarticle/32814/commerzbank-applies-machine-learning-to-trade-finance-compliance
[38] https://www.lntinfotech.com/digital-transformation/artificial-intelligence-cognitive/trade-finance-automation/

Conclusion and Implications for Sri Lanka

As this paper has highlighted, the global trade finance industry that has typically faced many challenges and pain points is beginning to show some exciting and encouraging new developments, driven by technology innovation. The global trade finance gap is substantial, estimated to be US$ 1.5 trillion per annum, and a staggering 60 per cent of trade finance requests from small businesses refused by banks. The provenance, transparency, and efficiency that technologies like blockchain can offer for transforming trade finance are now increasingly recognised. The technologies discussed in this paper are gaining more ground – beyond mere experimentation in small pockets of the trade finance world.

While some financial services institutions in the world will naturally adopt the new trade finance technologies quicker than others, the broader trend towards more digitisation and innovation is clear. For Sri Lanka's banks and technology companies, there presents a unique opportunity to help our firms – particularly our SMEs –get the benefits of trade finance innovation. Given the country's ambitions to position itself as competitive trade and logistics hub in the Indian Ocean region, as well as efforts to establish a regionally attractive financial city, the 'Tech4Trade' agenda in general and the trade finance innovation agenda in particular, are important areas to focus on. Perhaps, the new legal, regulatory and administrative structure that the 'Colombo International Financial City' is set to offer, can be a sandbox for technology innovation in trade finance, where Sri Lanka can be a testbed and experimentation hub, for the big financial services players to operate from; while at the same time not risking destabilizing the traditional banking sector. In addition to this, however, some level of technology innovation in trade finance needs to become mainstream in the country's banking sector, in order to drive new efficiencies, cut time and costs for firms, and truly make the country competitive in the international trade transactions arena. Regulators, financial services industry players (both local and foreign), and technology firms need to work closely together to make this happen.

The author wishes to appreciate the contribution made by Aindrie Kuruppu and Dilki Wijeyesekera, economics students at the Royal Institute in Colombo, in compiling this article.