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Trade finance in Qatar: blockchain and economic diversification

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Trade finance helps businesses deal with abnormal cash flows whilst managing counterparty risk and enhancing confidence in commercial transactions. It also allows parties to overcome trust barriers that may inhibit commercial activity in both a domestic and international commercial context. Globally, particularly among micro, small and medium enterprises (MSMEs), there exists a significant and widening unmet demand for documentary finance. Securing trade finance is laborious and time-consuming. For MSMEs, the trade finance application process alone, can be an insurmountable barrier that usually ends in rejection. By its nature, trade finance arrangements engage with decentralized stakeholders and diffused information sources across supply chains. Issuers and underwriters of trade finance instruments are required to draw on disparate elements of information, not merely during the application phase, but indeed throughout the life of a transaction. Blockchain technology is similarly decentralized and can capture information in a secure, transparent and immutable manner potentially improving and reinvigorating the trade finance space. As Qatar embarks on a strategy of widening its economic base away from a singular reliance on the hydrocarbon fuel sector, the introduction of blockchain technology holds the potential to overcome the transactional friction associated with trade finance. A more efficient and accessible trade finance sector will ultimately enhance the competitiveness of MSMEs whilst simultaneously fostering the growing FinTech sector in Qatar.

I. Introduction

Trade finance assists enterprises seeking to capitalize on opportunities irrespective of their current liquidity status. Recent figures posited that annually, 80% of global commerce requires some form of trade finance.¹ There is a huge unmet demand for trade finance from micro, small and medium enterprises (MSMEs) estimated to be upwards of approximately \$1.5 trillion.² Many SMEs avoid even seeking trade finance given the time consuming nature of the application process and high rejection rates.³ Application processes require high levels of disclosure and documentary proof especially in the context of international trade. Given the rapid pace of global commerce, it is no surprise, therefore, that in recent years, the trade finance sector has been shrinking.⁴ Global revenues from trade finance are estimated at around \$50 billion annually. In relative terms, compared to other financial markets, the trade finance market is significant – but small. The decline in the trade finance market is mainly due to the increased costs and regulations associated

with regulatory measures aimed at countering fraud, money laundering and terrorist financing.⁵

The pain points associated with trade finance are being addressed by a new generation of technologies focused on secure data sharing. At the head of these technologies is blockchain. Blockchain can provide a more cost-effective approach to data collection, storing and sharing all of which are critical to trade finance. A regenerated trade finance sector that is transparent and accessible will provide MSMEs greater access to financial support. This, in turn, will diversify the economic base of a country in two ways. One, it will allow smaller players to access global markets; and two, it will give rise to a new and growing sector focused on financial technology (FinTech) and regulatory technology (RegTech) in trade finance and more broadly.

For jurisdictions such as Qatar, where facilitating non-hydrocarbon fuel-based trade is a strategic priority, supporting this trend can achieve the diversification outcomes desired and expressed in their national vision (QNV2030).⁶

This article will examine the blockchain and trade finance discussion through the prism of Qatar. Central to this study is the logistical and administrative process of obtaining trade finance; with Qatar serving as an indicative jurisdiction where clear efficiency gains are possible with the appropriate adaptation of blockchain technology. Within the Qatari legal framework, and amidst the growing fintech sector, the benefits and risks to Qatar illustrate the promise of blockchain and the risks of seeing this new innovation as a panacea.

II. Qatari context

Qatar gained independence in 1971 and has rapidly become an important regional and international player in economic, political and cultural contexts.⁷ Qatar has a small local population yet generates substantial revenues from its natural gas reserves (the third-largest proven natural gas reserves globally). Qatar also enjoys one of the world's highest GDP per capita.⁸ Qatar's oil and natural gas resources are the country's main economic engine and government revenue source, which represents two-thirds of its GDP (USD 191.85 bn) and almost 80% of export earnings.⁹ Natural Gas is the main driving force of Qatar's high economic growth and per capita income levels, robust state spending on public entitlements, and booming construction spending – particularly as Qatar prepares to host the World Cup in 2022.¹⁰ The services sector is based mainly on financial services and is estimated to account for 42.7% of non-hydrocarbon GDP, providing employment to 44.3% of service based labour force. Tourism is also an important economic sector: the Qatari government expects to increase the share of tourism in GDP to 4% from 3.5% by 2023.¹¹

The World Competitiveness Yearbook 2020 ranked Qatar 6th internationally in economic performance, reflecting Qatar's strong performance across various fields. The report also ranked Qatar's government efficiency at 7th and business efficiency 11th.¹²

Although the nation's economy is reliant on the export of hydrocarbons, more than ten years ago Qatar adopted the Qatar National Vision 2030 (QNV 2030) aimed at strengthening and diversifying its economy.¹³ Revenue from oil and gas assets have been invested into improved infrastructure and public services, the creation of a skilled and productive labour force, and the support of entrepreneurship and innovation related initiatives. In turn, these achievements would provide a broader platform for the diversification of the country's economy as well as its emergence as a regional centre for both knowledge and high-value industrial and service activities.

III. Blockchain and enhancing economic diversification

Blockchain is the underlying data management architecture of bitcoin.¹⁴ It is a decentralized method of storing data safely and securely using public key cryptography¹⁵ and peer verification.¹⁶ Blockchain systems can be permissioned

(private)¹⁷ and/or permissionless (public).¹⁸ The core attributes of blockchain are that data is not centrally stored, but rather stored on several network-connected¹⁹ computers known as "nodes". The data that is stored is synchronized across all nodes when it is updated on any one end. Importantly, rather than replacing existing information with the updated data, any data inputted onto the system is added and linked to previous data creating an immutable²⁰ chain of time-stamped and historically accurate transactions.

As global economic systems become more data reliant and data-centric, the storage, sharing and use of data is also becoming crucial to commercial life at all levels. Blockchain data management systems help to overcome some of the uncertainties and risks associated with data-based transactions. The security of data, both in terms of loss of data or unauthorized access is overcome through the decentralized and cryptographic nature of blockchain.²¹ The veracity of historical data for auditing purposes is similarly secured through blockchain.

In the context of trade finance, blockchain technology can radically improve operational efficiency both in the application process and execution phases for all stakeholders. Blockchain in trade finance has the potential to be a paradigm shift. For example, a bank issuing a trade finance instrument must usually rely on insurance certificates issued by an insurance company with full transparency and accuracy as to the goods being insured. Blockchain can greatly reduce the number of steps and verifications required of this one single transaction helping to simplify the overall process. Banks can also access and confidently rely upon records of customs clearance verifications imputed by government officials. In turn, those government officials may also rely on certificates of origin (COs) issued by international counterparts for goods. A harmonized blockchain based system of supply chain traceability has to clear potential to alleviate risk associated with trade finance by creating a transparent data sharing infrastructure. Risk of malicious alteration of documentary proof will be, to a large extent, reduced if not eliminated.²²

Banks may also more accurately craft their payment terms commensurate with the associated levels of risk. *Ceteris Paribus*, reduced risk ought to consequently translate into more favourable trade finance payment terms for MSMEs. All parties, including the buyer, the bank of the buyer, the bank of seller, the seller and the shipper can all be plugged into an interconnected and transparent process. The enhanced trust and reduced risk will very likely unlock the unmet liquidity requirements of MSMEs.²³

The current trade finance system requires smaller banks to keep an elaborate set of contacts across the globe. This costly and burdensome method often precludes smaller banks from offering trade finance in many instances.²⁴ Blockchain can consequently make the offering of trade finance easier, cheaper and more widespread, driving competition in the trade finance sector and increasing business for smaller banks, while improving access to trade finance for businesses.²⁵

As explored further below, Qatari trade finance arrangements and infrastructure mirror those of most jurisdictions. As with Qatar, most systems are privately administered and ad hoc, with laborious analogue application processes and

disjointed data sharing. These conditions indicate that there exist significant blockchain-inspired efficiency gains both in the Qatari trade finance market but also more generally.²⁶ The associated benefits of strengthening trade finance as a core pillar of commercial diversification will support the efforts of Qatari policymakers to strategically achieve their envisioned economic diversification goals.

IV. Obtaining trade finance in Qatar

The process of obtaining trade finance in Qatar is cumbersome, inconsistent and policy based at the level of financial institutions. For domestic and geopolitical reasons, in recent years, Qatar has placed a huge emphasis on strengthening its financial system against potential money laundering threats and terrorist financing risks.²⁷ Atop existing trade finance paper requirements, the KYC/AML/CTF agenda has made a difficult process even more so.

A. Business framework

Qatari law does not provide a set framework for the provision of trade finance facilities. The terms upon which the various trade finance facilities are provided differ from business to business as specific requirements are set by individual providers. Each provider may have slightly different requirements for each type of trade finance facility on offer. The nature and extent of documentation is therefore left to individual trade finance providers and is a function of each banks' respective risk profile, internal discipline and commercial strategy and loan posture. Understanding the internal decision making motivations of each financial provider in Qatar is difficult from the outside looking in. The application process set by each player is, however, discernable from the outside, and reveals important aspects of the overall trade finance market in Qatar. For example, *Qatar National Bank* (QNB) (the largest bank in Qatar and the Middle East) requires that any applicant for a general trade finance facility should be an existing corporate customer of QNB and have been in operation for at least 6 months prior to lodging an application.²⁸ These are the internal policies of QNB and are not specifically dictated by Qatari law. Each specific trade finance instrument may require additional documentation depending on the business operations and risk appetite of the issuing financial institutions. An application for a documentary letter of credit through *Commercial Bank LLC*, for example, requires signed import invoices, a trade certificate from a Qatari trade consulate, packing list, insurance policy certificate, payment consent forms, bills of lading, shipping marks and a description of goods.²⁹ The process is very document-intensive.

In Qatar, as elsewhere, there are various types of trade finance instruments available through the eighteen registered banks. Not all Qatari banks offer all facilities. The main trade finance instruments available in Qatar are letters of credit, letters of guarantee, bills of exchange, promissory notes, cheques, documentary bills (documents against payment (DP) / documents against acceptance (DA)) and export bills for collection (EBC).

Although there are other more niche and novel arrangements, the above facilities represent the main trade finance instruments available in Qatar.

In Qatar, letters of credit (L/C) are the most common instrument for trade finance.³⁰ Although Articles 368–399 of Law No. 27 of 2006 (*Commercial Code*) regulate L/C requirements and conditions, the legal system in Qatar does not dictate the business process required for their issuance. Rather, as per Article 388 of the *Commercial Code*:

The application for letters of credit, supporting documentation and notifications thereof shall identify carefully documents for the implementation of payment/fulfillment, acceptance or deduction.

The broad outlines of the trade finance transaction (as executed) are stipulated, however, the requirements attaching to application and issuing specifications are not. Article 386, for example, provides that the bank will undertake, upon the request of the L/C holder, to pay the beneficiary (exporter) when the bank receives certain documents that represent the exported goods.³¹ In addition, Article 394 states that the bank providing financial guarantees in the L/C is obliged to take due diligence to check documents representing the exported goods to verify existence and compliance with the instructions of the applicant of the L/C.³² The core elements of a L/C are reflected in the law, the operational details are not.

B. Legal framework

Given the prominent role played by the internal policies of financial institutions in relation to trade finance applications in Qatar, it is natural to ask what role, if any, can the Qatari legal system play to promote the adoption of blockchain specifically in trade finance?

The legal dimensions relating to the use of blockchain in trade finance have proven to be an obstacle to the proliferation and adoption of the technology around the world (see Appendix 1). In a recent study, more than 60% of surveyed firms perceived “legal obstacles” as representing a “big challenge” to implementing blockchain in trade finance. Approximately 25% saw “legal obstacles” as a “small challenge” and only 7% believed there was “no challenge” associated with legal issues pertaining to ownership of data or jurisdictional issues arising from the use of blockchain in trade finance.

Blockchain technology is not directly regulated in Qatar. It is subject, however, to other legal regimes such as the *Cybercrime Law 2014*³³ and the *Data Privacy Protection Law 2016*.³⁴ By contrast, as previously noted, legal rules do exist outlining trade finance instruments in Qatar. Those specific laws address the core characteristics of trade finance instruments, as well as the rights and obligations arising from established and recognized trade finance arrangements. Complicating matters somewhat are the jurisdictional arrangements in Qatar between the state proper and relatively recent establishment of free zones.³⁵ The creation of the Qatar Financial Centre (QFC) in 2005, for example, has added an extra dimension to trade finance legal considerations. Understanding the laws applying to trade finance in Qatar must therefore address the multi-jurisdictional nature of Qatar's commercial and investment arrangements.

i. Laws within the State of Qatar

The Qatar legal system is based on the European Civil Law model which has permeated the Middle East largely due to the influence of Egyptian jurisprudence in the formative years of Middle Eastern statecraft. The starting point for understanding trade finance related laws in Qatar is the *Commercial Code*. Specifically, Part 4 Chapter 6 of the *Code* deals with banking operations and covers many of the trade finance instruments offered by Qatari banks. The specific nature and characteristics of these various legal arrangements include: simple credit facilities (Articles 380–385), letters of credit (Articles 386–399), letters of guarantee (Articles 406–413), acceptance credit (Articles 429–431), demand guarantees, bills of exchange (Articles 453–555), promissory notes (Articles 556–559) and cheques (Articles 560–605). Unlike common law jurisdictions, there is no case law supplementing or elucidating legislative provisions.

ii. Qatar Financial Centre (QFC)

The QFC is an onshore business and financial hub. It was established by the Qatari government in 2005 by *Law No. 7 of 2005 (QFC Law)*. The stated goal of the QFC is to attract international and domestic financial and professional services to establish a base in Qatar to service the state and the region.³⁶ The QFC has its own legal jurisdiction based on English common law administered by an international body of eminent jurists.³⁷ The QFC is operated and managed by the Qatar Financial Centre Authority (QFCA), which is responsible for the commercial strategy and business development for the centre and provides its administrative functions.³⁸ The QFC Regulatory Authority (QFCRA) is an independent regulatory body that has powers to authorize, supervise and discipline QFC firms and individuals.³⁹ There is also the QFC Companies Registration Office (CRO) which can register limited liability companies and limited liability partnerships within the QFC, and QFC-based branches of foreign companies.⁴⁰

QFC firms and companies are wholly treated as being local companies for business purposes. The founders, members, and shareholders are permitted to be Qatari or any other nationality.⁴¹ QFC companies can also conduct business from anywhere in Qatar.⁴² In addition, they enjoy competitive benefits, such as operating within an international legal environment, the right to trade in any currency, 100% foreign ownership, 100% repatriation of profits, 10% corporate tax on locally sourced profits, and an extensive double tax treaty agreement network with more than sixty countries.⁴³

1. Regulated and non-regulated activities Applicants may establish a presence in the QFC to carry out “Permitted Activities”.⁴⁴ These Permitted Activities are further divided into “Regulated” and “Non-Regulated” activities.⁴⁵ Regulated activities are financial services activities, and unregulated activities are all other non-financial professional services. “Professional services” straddle the sectors of law, accounting, recruitment, sports and events management, management consultancy services etc.⁴⁶ A comprehensive list of permitted Non-Regulated Activities are in *schedule 3* of the *QFC Law*.⁴⁷ The QFCA has recently expanded the interpretation of the

Non-Regulated Activities to include several new categories.⁴⁸ Importantly for this discussion on blockchain and trade finance, this expansion introduced a new Fintech Services category that specifically contemplates technology services that facilitate financial transactions.⁴⁹

Regulated Activities that touch financial services are also listed in *schedule 3* of the *QFC Law*. These activities require close and continuing scrutiny to ensure prudential soundness and acceptable conduct.⁵⁰ If an applicant wishes to conduct one or more of the Regulated Activities, they must be licensed by the QFCA⁵¹ and also authorized by the Qatar Financial Centre Regulatory Authority (QFCRA).⁵²

C. The Qatar Central Bank (QCB) and enforceable credit provision parameters

The Qatar Central Bank (QCB) is the main financial regulator in the state of Qatar.⁵³ All banks and finance companies operating in Qatar must be licensed and regulated by the QCB. Article 77 of *Law No. 13 of 2012 regarding the Qatar Central Bank and the Regulation of Financial Institutions (QCB Law)* states⁵⁴:

It is prohibited to provide any financial services or to carry out the activities and businesses stipulated in this law and its implementing resolutions, without being duly licensed by the QCB.

Additionally, Article 205 provides⁵⁵:

... any entity providing financial services without a license from the QCB is liable to be imprisoned for not more than three years and fined for not more than QAR 5,000,000. Under the Old QCB Law a specific penalty did not exist for providing financial services in Qatar without a license. Any breach under the Old Law would result in a fine of QAR 5,000 per day.

Importantly, for the context of trade finance, Article 70 of QCB Law empowers the QCB to set the conditions for granting loans, and to set interest rates applicable in Qatar. Article 70 provides⁵⁶:

... the QCB shall control returns rates and interest rates, and the conditions for granting loans and accepting deposits in the various financial institutions. The interest rate or yield determined by the QCB shall apply to Non-performing credit facilities and to rescheduled credit facilities, unless another rate has been agreed between the lending financial institutions and their customers.

In 2014, the QCB issued the sixth edition of its “Instructions to Finance Institutions (IFI)” which supplements the *QCB Law* and aligns previous instructions with the new rules in the 2012 *QCB Law*.⁵⁷ The IFI consist of all previous QCB circulars, which have become an integral part of these instructions.⁵⁸ All finance companies are required to comply with these instructions in the conduct of their business activities.⁵⁹ The IFI have twenty chapters.⁶⁰ Chapter 3 reflects Circular No. 38 of 2014 regarding criteria and limits for granting credit, which deal and regulate the requirements and limits to grant credit for individuals and corporate entities by finance companies.⁶¹ According to Paragraph 3 of the

aforementioned Circular,⁶² a finance company may grant loans or finance to its corporate or individual clients for other purposes, in exchange for payment means and financial resources, provided that the finance provider take into consideration the following:

- (1) Checking the regular flow of payment resources of the clients, and their adequacy to cover their obligations under the credit agreement, and to take into consideration those payment resources to decide the amount of the credit, its duration, conditions, interest rates, method of payment and the value and nature of the guarantees.
- (2) Obtaining collateral guarantees as one of the most important means of limiting credit risk, so that such guarantees cover or exceeds the value of the credit granted. The granting of the credit without specific collateral would have to be strongly justified by other guaranteed payment resources.
- (3) Observe proper banking rules and principles for granting credit in accordance with best practice.
- (4) The term of the loan does not exceed 7 years, including grace periods if any, and which should not exceed 6 months

Beyond the legal outlines contained in the *Commercial Code*, the QCB has set more detailed rules applicable to banks and finance companies. Beyond these rules, the QCB has left finance companies to set the more granular credit terms for specific transactions with specific clients. Moreover, in terms of macro supervision, the extensive mandatory QCB reporting requirements imposed on all regulated entities include trade finance exposure and liability acknowledgments. In terms of regulation therefore, blockchain systems can also enhance oversight and prudential monitoring through regulation-focused technology solutions (RegTech).

V. Growth of FinTech in Qatar

The growth of the FinTech sector in Qatar is an ongoing process. This momentum in digital finance bodes well for the adoption of blockchain innovations pertaining to trade finance in Qatar. The financial sector, and particularly, FinTech has been identified by Qatari policy makers as a growth sector that is, by its very nature, transformational for the broader economy. The first plank of this strategy has been to encourage and support innovation in payments services platforms in Qatar. To this end, the Qatar Development Bank, (QDB) has established a focal point for private sector FinTech developments in the form of the “Qatar FinTech Hub” (QFH). The QFH provides both financial and non-financial support⁶³ for firms seeking to nurture and grow their FinTech ideas and operations in the Qatari market.⁶⁴

In 2020, the Qatar Central Bank (QCB), as the principal financial regulator in the country, is also poised to launched its regulatory sandbox allowing FinTech firms to apply to test their services in a live (but risk-managed) environment.⁶⁵

Education, and the support of FinTech developments emerging from educational institutions is also a strong positive factor differentiating the Qatari FinTech scene. Indeed,

the national research funding body (Qatar National Research Fund (QNRF)) has, in recent years, invested significant funds in FinTech related research and academic support.⁶⁶

On the regulatory front, in 2019, the Qatar Financial Centre Authority (QFCA) broadened its interpretation of the professional and business services activities specified in Schedule 3 of the QFC Law to include “FinTech Services”.⁶⁷ Additionally the QFC is imminently launching its “FinTech Circle” which will provide QFC licensed firms with free office space in Doha to assist product development and market entry.

As noted above, in 2019 the QFC introduced within its platform a new permitted activity under the name “FinTech Service Provider”. The operational definition adopted by the QFCA in relation to this new category is:

An establishment engaged in providing technology-enabled innovation in financial services that could result in new business models, applications, processes or products with an associated material effect on financial markets and institutions and the provision of financial services.

FinTech services will typically include the following services or a combination thereof:

Activity	Explanation
1. Providing cybersecurity solutions.	
2. Providing application programming interfaces (APIs) over the internet.	APIs are a set of rules and specifications followed by software programs to communicate with each other, and an interface between different software programs that facilitates their interaction.
3. Providing cloud computing solutions.	Cloud computing is an innovation in computing that allows for the use of an online network (“cloud”) of hosting processors to increase the scale and flexibility of computing capacity.
4. The development and promotion of blockchain-based technologies through applications of distributed ledger technology.	Distributed ledger technology is a means of saving information through a distributed ledger, i.e. a repeated digital copy of data at multiple locations, as in blockchain. Potential applications of DLT in financial services include innovations in payments and securities clearing and settlement, crypto-assets, trade finance, and mortgage loan applications, among others
5. Providing platform(s) for facilitating real-time transaction capability of internet-connected devices	
6. Offering innovative ways of delivering computing resources, including data storage, software processing, e-mail handling etc.	

(Continued)

Continued

Activity	Explanation
7. Developing algorithm-based portfolio management, personal finance management, and budgeting tools.	
8. Ancillary unregulated services that the Qatar Financial Centre Authority deems necessary to the provision of FinTech Services.	

Beyond the inclusion of this specific category within which trade finance blockchain solutions could easily fit, the QFC regulations also already acknowledge trade finance obligations in their banking regulations when examining the exposure of banks. For example, for supervisory purposes, when looking at trade finance exposure on the balance sheets or outstanding obligations of authorized firms, QFC regulations have specific rules for both conventional banks⁶⁸ and Islamic banks.⁶⁹

Trade finance is a B2B transaction which perfectly suits the QFC environment in that QFC authorized banks are restricted from serving the local retail market and are restricted to the B2B space. Coupled with the new FinTech services licensing category, the QFC represents an ideal investment and regulatory platform for blockchain powered trade finance solution providers in Qatar. In this context, the Bank of China (BOC) has an established QFC branch which engages in the provision of B2B trade finance services to the local corporate market.⁷⁰ Given China's aggressive adoption of blockchain at national level,⁷¹ BOC may well be the first mover in rolling out blockchain based trade finance services in Qatar.

VI. The use of blockchain in the regeneration of trade finance

Blockchain technology is breathing new life into the trade finance space. Both from a macro and micro perspective, blockchain is transforming trade finance. At the macro level, platforms such as eWTP (the electronic world trade platform) are leveraging blockchain technology to streamline global trade flows. eWTP is a Chinese led initiative endorsed by the G20 and was first proposed in 2016 by former Alibaba Group chair Jack Ma. The platform describes itself as⁷²:

... a private sector-led and all stakeholder initiative, for public-private cooperation to incubate e-Trade rules and foster a more effective and efficient policy and business environment for cross border electronic trade (eTrade) development.

Indeed, the use of blockchain technology in simplifying trade finance processes comes within a broader international effort by the WTO, UNCTAD, ICC, WCO and other international organizations to promote the so-called eTrade agenda.

The key to international adoption of blockchain in trade finance is interoperability.⁷³ Given global trade tensions between governments in recent years, cooperation of this

kind will likely be led by private sector consortia.⁷⁴ Such consortia, in the form of R3CEV (or "R3"), already exists for the specific purpose of promoting the use of blockchain in the banking sector.⁷⁵ Coupled with the broad adoption of open source blockchain platforms (such as "Corda"⁷⁶ and "hyperledger"⁷⁷), there is momentum and clear potential behind the growth of blockchain in finance generally – and trade finance specifically.

At the micro level, several startups are disrupting the ailing trade finance sector by applying blockchain to outdated analogue processes.⁷⁸ Innovative services such as *Wave BL*⁷⁹ (BL referring to "bill of lading") and *SKUchain*⁸⁰ are reviving trade finance procedures by eliminating (or at least streamlining) pain points for applicants and issuers alike.⁸¹ In a comprehensive exposition, Chang et al have mapped trade finance pain points and potential alleviations resulting from the adoption of blockchain:

Issues	Global Trade Pain Points	Potentials utilizing blockchain L/C
Trust Mechanisms	Heavily Relying on an authorized central party (e.g. banks) as intermediary to cope with trade finance.	Use of immutable, consensus-based, and distributed ledger network to build up trustful trade environment
Fraud and authenticity	Malicious attempts which may cause fraud, alterations, later trade disputes; Authorities involved in building up trust among trade parties.	Keeping contract terms on blocks and permanently recording alterations of contract terms on a chain; Mitigating the tampering issue.
Document Type	Paper-based and manual processing; Lengthy delivery.	Digitized documents deployed on a secured and distributed shared ledger.
Transactions	Risk sensitive; Relying on authorized third parties.	Risk mitigation. Trust ensured through the use of consensus mechanisms.
Bill(s) of Lading (B/Ls)	Intensive paperwork for presentation. Lengthy delivery across borders; Complex ownership transfer across.	Digitized operation; Reduced time transfer and delivery; Blockchain-based identification without presentation of B/Ls.
Information Transmission	Manual processing which takes the expense of time and cost; Centralized data manipulations which may suffer from cyber-attacks or system malfunctions.	Event-driven mechanism with smart contract settings. Consensus mechanism with tamper-proof features. Less security and privacy concerns on consortium chain
Traceability	Complex trade processing due to multiple participants; Uncertainties caused by handovers in tracking asset identities, ownership, and shipment status.	A member database which can be searched for an examination of credit ratings, thus resulting in better user experience.

Source: Chang, 2020 page 6.

The promise of technology-enhanced trade finance is discussed by Larson in the context of harmonized letters of credit.⁸² Larson describes a vision whereby Radio-Frequency Identification (RFID) labelled goods are scanned at all stages of a shipping process leveraging the internet of things (IoT) to time-stamp, record and report the status of a shipment on a transparent blockchain available to all stakeholders involved in the transaction. Based on this vision, blockchain technology would therefore lie at the heart of an integrated process of supply chain verifications linked with the legal documentation underlying the transaction. The main benefit of this system is the reduction of risk associated with trade finance in the context of letters of credit through enhanced monitoring.

The potential of blockchain, as it might apply to trade finance, is twofold. Blockchain could improve existing processes and mechanisms, whilst also opening up new types of trade-facilitating financial arrangements geared towards MSMEs. In an international context, where trade is global, the introduction of a new novel approach faces serious obstacles in the form of commercial and procedural inertia.

On the technical side, the challenges are surmountable given the growth of cloud computing and transnational data infrastructure such as Amazon Web Services.⁸³ The real challenges lay in the legacy trade finance regulatory arrangements across the world. Prevailing trade finance instruments are the result of centuries of refinement in the world of international trade, and they will not easily be changed.

A 2019 survey from the Cambridge Judge School of Management found that the first generation of blockchain adoption is being justified by business users as a cost-saving technology.⁸⁴ Most envision that it will later produce new products and services that will generate revenues. Presently, however, blockchain is perceived as a “back of office” enhancement, and it is precisely the back-office procedures where trade finance facilities currently suffer most. In inter-bank messaging protocols, for example. Blockchain can improve the security and reliability of Bank payment obligations (BPOs)⁸⁵ and MT789 messaging.⁸⁶ These improvements, as noted above by Chang et al, exist across the trade finance value chain and whilst alone these improvements might be marginal, cumulatively the gains are significant. Beyond direct gains to trade finance providers and clients, the overflow economic benefits associated with unlocking MSMEs is even greater.

For Qatar specifically, non-hydrocarbon trade is significantly import oriented. Although some Qatari firms are engaged in export activities,⁸⁷ the mass of international trade is inward directed. An enhanced blockchain powered trade finance market will help Qatari exporters but will most greatly benefit importers. The potential for Qatar, in economic terms, may lie with the benefits derived by foreign firms engaged in exporting to Qatar growing their business to such an extent that they establish local operational entities to capitalize on market share. The “meta-benefits” to Qatar’s economic diversification efforts are also enhanced through the growth in the FinTech sector itself as blockchain technology becomes more widely utilized.

VII. Assessing risks associated with using blockchain in trade finance

A report by the European Banking Authority (EBA) identified both opportunities for business resulting from FinTech, as well as possible prudential risks.⁸⁸

The EBA identify several issues pertaining to jurisdictions. One is the possible lack of enforceability of digitally executed contracts in some jurisdictions. Another is the legal risk of uncertainty as to the applicable governing jurisdiction for dispute resolution. This could happen because the verifying nodes involved in the blockchain may be physically based in differing countries. This has the potential to lead to a problematic conflict of laws when a dispute arises. The EBA itself, however, acknowledges that this risk can be avoided by clearly setting out both the agreed applicable jurisdiction (which permits digitally executed contracts) and the dispute resolution mechanism.⁸⁹ Such a solution is standard practice in any cross-border contract and is not considered herein to be a significant issue.

The EBA point to liability issues arising caused by lack of a central governing body. For example, it could be uncertain as to who is responsible when private keys are lost. If the responsible party is lax, such poor governance could allow non-compliance with governance rules. This could damage the credibility of the blockchain. Cybersecurity in the form of digital key back-ups, record-keeping and rigid governance would all be essential to maintain the integrity of the network.⁹⁰

Since blockchain reduces the labour-intensive process involved in verifying documents, there are concerns about users being able to avoid AML/CTF compliance. Customer due diligence processes also differ across jurisdictions. Nevertheless, these processes, if stringently implemented, can result in the contrary outcomes of increased certainty, transparency and compliance in real-time if all the organizations involved maintain the same standards. Real-time authentication can indeed both improve the customer experience and produce immutable customer records.⁹¹

To summarize, while it is important to identify and understand risks involved in adopting a new process, there do not appear to be any insurmountable legal risks with adopting blockchain technological solutions in trade finance.

VIII. Conclusion

The trade finance process in Qatar is presently shaped by the operational requirements of financial institutions with the broad outlines of the *Commercial Code* and slightly more detailed provisions of the QCB. The law provides clarification pertaining to definitions, rights and liabilities arising from trade finance instruments. The commercial application processes, across providers, remain tedious and costly. The organization of various documents and attestations as to their validity and currency present, and have historically presented, obstacles to the smooth flow of trade finance supported trade in Qatar and globally. At an international level, there is a vast trade finance gap that disproportionately impacts MSMEs.

Applied prudently, blockchain technology can greatly enhance all manner of trade finance processes globally.

Banks can increase their customer base and reduce processing costs through automation.⁹² Fraudulent applications and supporting documentation can be significantly reduced, and businesses can benefit from improved access to previously unreachable markets through trade finance support. Blockchain also improves both the speed and simplicity of accessing trade finance instruments and the overall transparency of application and performance phases of the trade finance process.⁹³ Though risks have been identified, these are manageable compared to the net benefits blockchain can offer of reducing trade finance related risks for banks and businesses.

As a case in point, blockchain powered trade finance in Qatar can drive the economic diversification policies established by in Qatar Vision 2030. The existing legal framework is capable of supporting the introduction of blockchain as a technical data retention and sharing platform with little or no need for specific blockchain-focused regulations. What is needed, therefore, is a doubling down of incentives and institutional support. Policymakers in Qatar are heeding these calls as institutional support that might open the way for blockchain proliferation is growing in the shape of the FinTech initiatives being introduced by the Qatar Central Bank, Qatar Development Bank and the Qatar Financial Centre. The blockchain-trade finance story is part of the broader national FinTech strategy in Qatar.⁹⁴ Although the current FinTech focus in Qatar is on payment services, the opportunity presented by blockchain in the context of trade finance will likely feature in upcoming policy cycles for it holds great potential in unlocking and driving Qatar's strategic vision and diversification goals. ■

Authors' contributions

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Notes

- ¹ Alisa Dicaprio and Benjamin Jessel, “Can Blockchain Make Trade Finance More Inclusive?” (2018) 47 *The CAPCO Institute Journal of Financial Transformation* 36. [Hereinafter Dicaprio & Jessel].
- ² Asian Development Bank, *Trade Finance Gaps, Growth and Jobs Survey* (2019). <https://www.adb.org/sites/default/files/publication/521096/adb-brief-113-2019-trade-finance-survey.pdf> (last accessed 1 July 2020). Participants in the 2019 survey included 112 banks from 47 countries, 53 export credit agencies from 17 countries, 39 forfaitors from 20 countries, and 336 firms from 68 countries.
- More than three-quarters of surveyed banks (76%) highlighted the requirements of anti-money laundering (AML) and KYC as the largest barrier to expanding trade finance operations. This was followed by high transaction costs and/or low fee income (59%), low credit ratings for the country where a firm is located (52%), as well as low credit ratings of banks in developing countries where they act as intermediaries for trade (51%), and low credit ratings of firms (43%).
- ³ The rejection rate of SME proposals is 45%, higher relative to mid-sized and larger-sized firms (39%) and multinational corporations (17%). Rejection reasons from the survey showed that 18% were rejected for serious KYC concerns, 20% for lacking additional collateral, 17% for poorly presented and insufficient information, 19% were deemed not suitable for support and 15% were found not profitable enough to process. *Ibid.*, 4–5.
- ⁴ According to Boston Consulting Group, this is also explained by the slowing down of trade growth and entering of new players into the market. Stefan Dab et al., “The Digital Revolution in Trade Finance”, *bcg.perspectives*, Boston Consulting Group (2016), <https://www.bcg.com/en-ca/publications/2016/digital-revolution-trade-finance.aspx> (last accessed 1 July 2020).
- ⁵ *Ibid.*, 3. According to Dicaprio and Jessel, double-invoicing is a common concern in trade finance. In this respect, the example is given of Standards Chartered that lost almost U.S. \$200 million from a fraud involving counterfeited paperwork, where different banks and trading houses were holding separate titles from the same metal at China’s Qingdao port in 2014. Dicaprio and Jessel, *supra* n 1, 42.
- ⁶ Qatar National Vision 2030, https://www.psa.gov.qa/en/qnv1/Documents/QNV2030_English_v2.pdf (last accessed 1 July 2020). [Hereinafter QNV 2030].
- ⁷ Oxford Business Group, Qatar, visit: <https://oxfordbusinessgroup.com/overview/strategic-sustainability-government-seeks-preserve-cultural-identity-and-rolls-out-strategic> (last accessed 2 July 2020).
- ⁸ *Ibid.*
- ⁹ “The Economic Context of Qatar”, see: <https://www.nordeatrade.com/fi/explore-new-market/qatar/economical-context> (last accessed 2 July 2020). [Hereinafter Economic Context of Qatar].
- ¹⁰ Under the Qatar National Vision 2030, nearly QR60bn (US \$16.4 billion) in infrastructure and real estate investments are planned over the next four years to help offset falling FIFA-investment spending and ensure a beneficial legacy. See World Bank, Qatar’s Economic Update – April 2020, <https://www.worldbank.org/en/country/gcc/publication/qatar-economic-update-april-2020> (last accessed 2 July 2020).
- ¹¹ Economic Context of Qatar, *supra* n 9.
- ¹² “Qatar Ranked Sixth Internationally in Economic Performance in 2020”, *The Peninsula*, 16 June 2020, <https://www.thepeninsulaqatar.com/article/16/06/2020/Qatar-ranked-sixth-internationally-in-economic-performance-in-2020> (last accessed 2 July 2020).
- ¹³ QNV 2030, *supra* n 6.
- ¹⁴ S Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008). <https://bitcoin.org/bitcoin.pdf> (last accessed 1 July 2020). Blockchain shouldn’t be confused with bitcoin. For the difference between the two, see: “What’s the Difference Between Blockchain and Bitcoin?” <https://www.euromoney.com/learning/blockchain-explained/the-difference-between-blockchain-and-bitcoin>; Tom Zilavy, “Understand the Difference Between Blockchain and Bitcoin”, <https://medium.com/datadriveninvestor/understand-the-difference-between-blockchain-and-bitcoin-6388183837b4>; “The Difference Between Bitcoin and Blockchain”, <https://www.e-zigurat.com/innovation-school/blog/difference-between-bitcoin-and-blockchain/> (last accessed 1 July 2020).
- ¹⁵ In a permissionless blockchain, information is publicly visible in an encrypted form. That information can only be altered through the use of a private key (i.e. a password). The cryptographic element at once secures the data but also allows for mathematical third-party verification of changes to the blockchain (proof of work).
- ¹⁶ Any alterations to the central blockchain file (dataset) must be verified by other third-party users of the blockchain who are usually incentivized in some way to devote their computing power to the verification process.
- ¹⁷ A private blockchain (sometimes referred to as “enterprise blockchain”) is administered by an appointed or nominated gatekeeper tasked with overseeing access to data. This type of blockchain system is usually used “in-house” within an organization. It is decentralized in nature, although the nodes upon which the data is stored are not as diffused as a permissionless blockchain such as bitcoin.
- ¹⁸ A permissionless blockchain is open to the public. Anyone can host the main blockchain file on their computer, engage in transactional verification or otherwise participate in the data management process subject to the endogenous requirements of that blockchain system.
- ¹⁹ All “nodes” could be all part of a private network, or they could be connected via the internet.
- ²⁰ Hypothetically there are ways to overcome immutability, even on public blockchain, through what is known as a 51% attack. Such an attack involves a critical mass of users (being usually more than 50% of the computing power used to verify transactions) agreeing to collectively halt verifications and even reverse transactions that take place while they are in control of the system. See <https://www.investopedia.com/terms/1/51-attack.asp> (last accessed 1 July 2020).
- ²¹ Primavera De Filippi, “The Interplay between Decentralization and Privacy: The Case of Blockchain Technologies” (2016) 7 *Journal of Peer Production*; Deepak Puthal, Nisha Malik and Saraju Mohanty, “The Blockchain as a Decentralized Security Framework” (2018) 7 (2) *IEEE Consumer Electronics Magazine* 18; J Truby, “Decarbonizing Bitcoin: Law and Policy Choices for Reducing the Energy Consumption of Blockchain Technologies and Digital Currencies” (2018b) *Energy Research and Social Science* 44, 399–410, <https://doi.org/10.1016/j.erss.2018.06.009>.
- ²² Shuchih Ernest Chang, Hueimin Louis Luo and YiChian Chen, “Blockchain-Enabled Trade Finance Innovation: A Potential Paradigm Shift on Using a Letter of Credit” (2020) 12 *Sustainability* 188.
- The risk cannot be totally eliminated, as the data that is originally inputted is may be false. What is alleviated is the risk that such data has been altered somewhere along the line over time.

- ²³ Barkley's cooperation with an innovative start-up, Wave, a decentralized blockchain hybrid crypto asset exchange platform can be an excellent case to show how blockchain allows the restoration of trust in trade (2016). Target goods, namely, cheese and butter, were transacted between Irish agricultural food cooperatives Ornua (formerly the Irish Dairy Board) and the Seychelles Trading Company. Ornua has suffered from expensive export coverage across countries, particularly for the time-intensive, complex, and lengthy processing of L/C issuance and approval. After introducing blockchain platform into the process, trade finance processing time has been substantially reduced, a paper-heavy transmission of L/C has averted, and overall performance has been enhanced. Another example can be the use by Japanese company "Marubeni" and insurance company "Sompo" of IBM's Hyperledger Fabric platform, which reduced the transaction duration from weeks to about two hours. *Ibid*, 7–8.
- ²⁴ See World Trade Organization, The challenges of trade financing, https://www.wto.org/english/thewto_e/coher_e/challenges_e.htm (last accessed 6 July 2020); Trade Finance Survey 2018: Plugging the trade finance gap, January 9, 2018, <https://www.euromoney.com/article/b1642p90c7f07h/trade-finance-survey-2018-plugging-the-trade-finance-gap?copyrightInfo=true> (last accessed 6 July 2020).
- ²⁵ M Attaran and A Gunasekaran, "Financial Services: The Largest Blockchain Market" in *Applications of Blockchain Technology in Business*. (Springer Briefs in Operations Management. Springer, 2019).
- ²⁶ According to the survey, transparency between all parties (114), gains in speed and efficiency (79), real time overview of transaction (69), and cost reduction (63) are top key benefits of DLT. See Appendix 1 Table.
- ²⁷ J Truby, "Measuring Qatar's Compliance with International Standards on Money Laundering and Countering the Financing of Terrorism" (2016) 19(3) *Journal of Money Laundering Control* 264–77, <https://doi.org/10.1108/JMLC-04-2015-0011>.
- ²⁸ <https://www.qnb.com/sites/qnb/qnbqatar/page/en/entradefinance.html> (last accessed 1 July 2020). Additionally, the applicant must provide a Company profile document, copy of recent and valid commercial registration certificate, a copy of valid license issued by the municipality, copies of ID of all partners/owners and authorized signatories, full audited reports of the last 3 years, non-QNB account statements for the last 6 months (if any).
- ²⁹ <https://www.cbq.qa/en/wholesale/products-services/pages/trade-finance.aspx> (last accessed 1 July 2020).
- ³⁰ IBP, Inc., *Qatar: Doing Business and Investing in Qatar Guide* (2019) 99.
- ³¹ Law No. 27 of 2006 Promulgating the Trading Regulation Law, Article 386. <https://almeezan.qa/LawArticles.aspx?LawTreeSectionID=9397&lawId=2572&language=en> (last accessed 1 July 2020).
- ³² *Ibid*, Article 394.
- ³³ Cybercrime Prevention Law No. 14 of 2014, <https://cra.gov.qa/en/document/cybercrime-prevention-law-no-14-of-2014> (last accessed 1 July 2020).
- ³⁴ Law No. 13 of 2016 Concerning Privacy and Protection of Personal Data; Qatar Financial Center (QFC) Data Protection Regulation No.6 of 2005, <https://qfcra-en.thomsonreuters.com/rulebook/data-protection-regulations-2005> (last accessed 1 July 2020). To the extent that information is international, any data on a blockchain would need to comply with GDPR in Europe and CCPA in California – both of which have global reach for data associated with European and Californian residents and entities respectively.
- The General Data Protection Regulation (GDPR) (2016/679) is a regulation in EU law on data protection and privacy in the European Union and the European Economic Area. For the details, see: <https://gdpr-info.eu/> (last accessed 2 July 2020); The California Consumer Privacy Act (CCPA) is a state statute intended to enhance privacy rights and consumer protection for the residents of California state, U.S.A. For details, see: <https://oag.ca.gov/privacy/ccpa> (last accessed 2 July 2020).
- ³⁵ See Andrew Dahdal, Douglas Arner and Gordon Walker, "The Qatari Financial Sector: Building Bridges between Domestic and International" (2017) 32(3) *Banking and Finance Law Review* 529.
- ³⁶ Zain Sharar and Mohammed Al Khulaifi, "The Courts in Qatar Financial Centre and Dubai International Financial Centre: A Comparative Analysis" (2016) 46(2) *Hong Kong Law Journal* 533. SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2846978 (last accessed 1 July 2020).
- ³⁷ Andrew Dahdal and Francis Botchway, "A Decade of Development: The Civil and Commercial Court of the Qatar Financial Centre" (2019) 34 *Arab Law Quarterly* 1.
- ³⁸ QFC Law No. 7 of 2005, Articles 3 and 5. https://qfcra-en.thomsonreuters.com/sites/default/files/net_file_store/QFC_Law-V3-Oct09.doc.pdf (last accessed 1 July 2020). [Hereinafter QFC Law].
- ³⁹ *Ibid*, Article 8.
- ⁴⁰ Pursuant to Article 6 the Companies Regulations of 2005, the Companies Registration Office maintains a register of Limited Liability Companies, Limited Liability Partnerships and Branches which are or have been registered with the CRO.
- ⁴¹ Policy Statement No. 1 of the QFC Firms Doing Business in Qatar, <https://www.qfcra.com/wp-content/uploads/2019/09/QFC-Firms-Doing-Business-in-the-State.pdf> (last accessed 30 May 2020).
- ⁴² *Ibid*.
- ⁴³ For more information, see: <https://www.qfc.qa/en/MediaCenter/News/Pages/2018growth.aspx> (last accessed 30 May 2020).
- ⁴⁴ QFC Law, *supra* n 38, Article 10.
- ⁴⁵ *Ibid*, SCHEDULE 3, Part 1 and Part 2.
- ⁴⁶ See Schedule 3, Part 2, QFC Law. For more information, see Al Tamimi and Co, *Setting up at in the Qatar Financial Centre* (2016), Chapter 4: <https://www.tamimi.com/wp-content/uploads/2017/10/Setting-Up-in-QFC.pdf> (last accessed 30 May 2020).
- ⁴⁷ *Ibid*. The following activities are considered to be Non-Regulated Activities: Shipping brokerage; Providing professional services including but not limited to audit, accounting, tax, consulting and legal services; Classification services and investment grading services; Company headquarters, management offices and treasury functions; Special purposes companies; Holding companies; Trusts and trust services; Single family offices.
- ⁴⁸ For more information, see: [https://www.qfc.qa/Admin/Resources/Resources/Professional%20Business%20Services%20Factsheet%20\(Jan2015\).pdf](https://www.qfc.qa/Admin/Resources/Resources/Professional%20Business%20Services%20Factsheet%20(Jan2015).pdf) (last accessed 30 May 2020).
- These new categories include: Information technology consultancy activities; Advertising agencies; Architectural activities; Engineering design activities for industrial process and production; Engineering related scientific and technical consulting activities; Environmental consulting activities; Media representation services; Translation and interpretation activities; Urban planning and landscape architectural activities; Accreditation; Logistics Planning and Consulting; Project Management; Marketing and Brand Management; Specialized design activities; Event management services; Estate planning and will writing; Activities of patent and copyright agents; other legal activities.

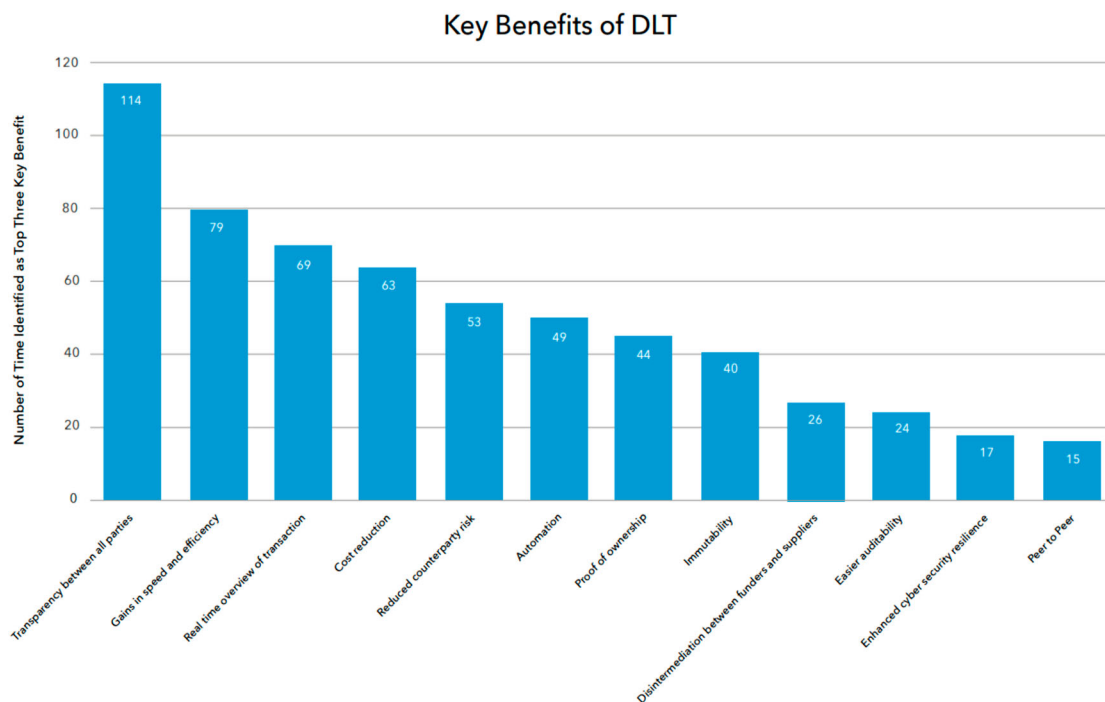
- ⁴⁹ Andrew Dahdal, “First Steps for Fintech Regulation in Qatar” (2019) 2 *The Qatar Business Law Review* 19.
- ⁵⁰ QFC Law, *supra* n 38, SCHEDULE 3 Part 2. The financial services include the following activities: Banking (including Corporate or wholesale banks, Investment banks, and private banks); Asset management (including retail schemes, qualified investor schemes, and private schemes); Insurance and reinsurance; Captives; Insurance brokerage; Islamic finance; Investment advice and investment services; Custodian services; Collective investment fund; Fiduciary businesses.
- ⁵¹ *Ibid*, Article 6(5).
- ⁵² *Ibid*, Article 8(1).
- ⁵³ According to Article 7 of the Law No.13 of 2012 regarding the Qatar Central Bank and the Regulation of Financial Institutions [Hereinafter QCB Law] which provides that “the QCB is competent higher authority, layout and enforce the State monetary policy, policy of the exchange rate and financial and banking supervision within the framework of the national strategy and in accordance with the best international standards and practices, and shall carry out the necessary”.
- ⁵⁴ QCB Law, Article 77.
- ⁵⁵ *Ibid*, Article 205. See also Articles 77–113 which provide the License requirements for financial institutions who wish to conduct financial services and other financial businesses and activities in the State of Qatar.
- ⁵⁶ *Ibid*, Article 70.
- ⁵⁷ For more details, see the Qatar Central Bank Arabic website: <https://www.qcb.gov.qa/Arabic/Legislation/Instructions/FinancialServicesInstitutions/Pages/FinanceCompaniesInstructions.aspx> (last accessed 30 May 2020).
- ⁵⁸ *Ibid*.
- ⁵⁹ *Ibid*.
- ⁶⁰ *Ibid*.
- ⁶¹ QCB Circular No. 38 of 2014 dated on 11 December 2014. For more details see: <https://www.qcb.gov.qa/Arabic/Legislation/Instructions/FinancialServicesInstitutions/FinanceInstructions/03.pdf> (last accessed 30 May 2020).
- ⁶² *Ibid*.
- ⁶³ QFH provides mentorship, regulatory, registration and other types of support for both local and international FinTechs.
- ⁶⁴ In line with Qatar’s Fintech strategy, Qatar Development Bank announced the launch of Incubator (for early-stage startups) and Accelerator (for mature FinTechs) programs. The programs are intended to serve local and global Fintech entrepreneurs who are looking for a launch pad and a hub to accelerate their growth. The programs will focus on key priority areas such as payment services solutions, solutions for SMEs, Islamic Fintech and regulatory technology.
- ⁶⁵ The Qatar Central Bank officially launched its regulatory sandbox in June 2020. Fintech firms can safely experiment their services in the field of digital payment services under strict supervision of the QCB and the guidance of an expert panel. The intake of applications has started, although the sandbox itself is not operational yet. Andrew Dahdal, “The Future for Digital Payments in Qatar”, *Middle East Business*, 17 June 2020, <https://www.middleeastbusiness.org/2020/06/17/the-future-for-digital-payments-in-qatar> (last accessed 2 July 2020).
- ⁶⁶ Fintech and Regtech: Building a Resilient, Inclusive and Competitive Legal and Regulatory Framework for 21st Century Finance in Qatar (NPRP11S-111-170016). This project will examine, review and propose a complete suite of legal reforms specifically for the Qatari financial services sector that address and support the significant global advances in digital technology. This project will significantly contribute to the realization of Qatar Vision 2030, the stated goals of the National Development Strategy (NDS) 2017–2022 and the Second Strategic Plan for the Financial Sector launched by the Qatar Central Bank in December 2017; A Secure End-to-End Blockchain-Based Solution to Finance Trade: The Legal, Technological, and Economic Framework (NPRP11C-1229-170007); A Road Map for Next Generation Financial Services in Qatar: Developing Use Cases, Policies and Governance Mechanisms for Implementing Blockchain Technology (NPRP11S-0117-180325); Extending Blockchain Technology – a Novel Paradigm and its Applications to Cybersecurity and Fintech (NPRP11S-0109-180242); Designing an Efficient Smart Contract based Blockchain System from Multi-modal Supply Chain Systems (NPRP11S-1227-170135).
- ⁶⁷ For more information, see: <https://www.qfc.qa/en/MediaCenter/News/Pages/more-fintech-providers.aspx> (last accessed 30 May 2020).
- ⁶⁸ QFCRA Banking Business Prudential Rules (2014), Articles 9.3.40, 9.5.31. https://qfcra-en.thomsonreuters.com/sites/default/files/net_file_store/QFCRA_9582_VER6.pdf (last accessed 2 July 2020).
- ⁶⁹ QFCRA Islamic Banking Business Prudential Rules (2015), Articles 8.4.41, 8.6.31. https://qfcra-en.thomsonreuters.com/sites/default/files/net_file_store/QFCRA_10464_VER5.pdf (last accessed 2 July 2020).
- ⁷⁰ Brief Introduction to Bank of China QFC Branch, https://www.bankofchina.com/qa/en/aboutus/ab1/201808/t20180806_13199943.html.
- ⁷¹ Wolfie Zhao and David Pan, “Inside China’s Plan to Power Global Blockchain Adoption” 20 April 2020, <https://www.coindesk.com/inside-chinas-plan-to-power-global-blockchain-adoption> (last accessed 6 August 2020).
- ⁷² Electronic World Trade Platform, for more details, see: <https://www.ewtp.org/about/introduction.html> (last accessed 2 July 2020).
- ⁷³ Joy McKnight, “Faster, Cheaper, Smarter: Blockchain in Trade Finance Distributed Ledger” (2018) *The Banker* 28.
- ⁷⁴ *Ibid*.
- ⁷⁵ For more info on Enterprise Blockchain Software R3, see: <https://www.r3.com/> (last accessed 2 July 2020).
- ⁷⁶ For more info on Corda as an open source blockchain platform for business, see: <https://www.corda.net/> (last accessed 2 July 2020).
- ⁷⁷ For more info on Hyperledger, see: <https://www.hyperledger.org/> (last accessed 2 July 2020).
- ⁷⁸ For a detailed exposition on current and conceptual DLT initiatives relating to trade, see: “Blockchain and DLT in Trade: A Reality Check”, by Deepesh Patel (TFG) and Emmanuelle Ganne (WTO), (November 2019). https://www.wto.org/english/res_e/booksp_e/blockchainrev19_e.pdf (last accessed 2 July 2020).
- ⁷⁹ <https://wavebl.com/> (last accessed 2 July 2020).
- ⁸⁰ <https://www.skuchain.com/> (last accessed 2 July 2020).
- ⁸¹ For a full list of businesses operating in this space, see: <https://www.tradefinanceglobal.com/blockchain/periodic-table/> (last accessed 2 July 2020).
- ⁸² Dakota A Larson, “Mitigating Risky Business: Modernizing Letters of Credit with Blockchain, Smart Contracts, and the Internet of Things” (2018) *Michigan State Law Review* 929.
- ⁸³ See Appendix 3 – Technical Challenges. The survey has been conducted under three categories – Interoperability, integration into back office systems and difficulty in choosing between various DLTs. The majority found them as a small challenge (91%, 88%, 78%), (48%, 48%, 32%) found them as a big challenge, and (8%, 12%, 22%) found them as not a challenge respectively.

- ⁸⁴ <https://www.jbs.cam.ac.uk/faculty-research/centres/alternative-finance/publications/2nd-global-enterprise-blockchain-benchmarking-study/> (last accessed 3 July 2020)
- ⁸⁵ <https://www.tradefinanceglobal.com/finance-products/bank-payment-obligation-bpo-urbpo/> (last accessed 2 July 2020).
- ⁸⁶ <https://www.tradefinanceglobal.com/letters-of-credit/mt798/> (last accessed 2 July 2020).
- ⁸⁷ Although Qatar mainly exports gas and oil, starting 2019 it has been exporting agricultural products such as vegetables, dairy products, meat and poultry. Visit: <https://www.thepeninsulaqatar.com/article/23/12/2018/Qatar-will-start-exporting-food-items-from-2019-Official> (last accessed 2 July 2020).
- ⁸⁸ European Banking Authority, EBA REPORT ON PRUDENTIAL RISKS AND OPPORTUNITIES ARISING FOR INSTITUTIONS FROM FINTECH, <https://eba.europa.eu/sites/default/documents/files/documents/10180/2270909/02c7859f-576e-421e-b243-a145c0eaa131/Report%20on%20prudential%20risks%20and%20opportunities%20arising%20for%20institutions%20from%20FinTech.pdf> (last accessed 7 July 2020).
- ⁸⁹ *Ibid.*, 33.

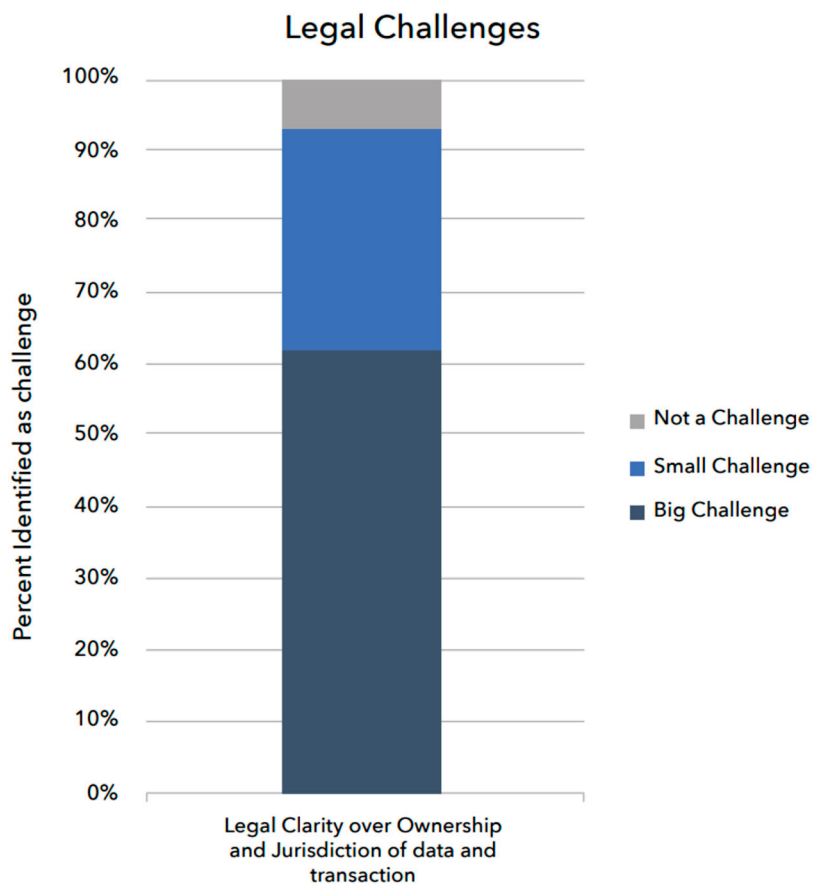
- ⁹⁰ *Ibid.*
- ⁹¹ (2018): Fintech and the city: Sandbox 2.0 policy and regulatory reform proposals, International Review of Law, Computers & Technology, doi:10.1080/13600869.2018.1546542L.
- ⁹² See the benefits of automation in Jon Truby, Rafael Brown and Andrew Dahdal, “Banking on AI: mandating a proactive approach to AI regulation in the financial sector” (2020) 14(2) *Law and Financial Markets Review* 110–20, doi:10.1080/17521440.2020.1760454.
- ⁹³ European Banking Authority, EBA REPORT ON PRUDENTIAL RISKS AND OPPORTUNITIES ARISING FOR INSTITUTIONS FROM FINTECH, <https://eba.europa.eu/sites/default/documents/files/documents/10180/2270909/02c7859f-576e-421e-b243-a145c0eaa131/Report%20on%20prudential%20risks%20and%20opportunities%20arising%20for%20institutions%20from%20FinTech.pdf> (last accessed 7 July 2020).
- ⁹⁴ Qatar Central Bank, The Second Strategic Plan for Financial Sector Regulation 2017–2022, at 55–57. <https://www.qcb.gov.qa/English/AboutQCB/Documents/The%20Second%20Strategic%20plan%202017-2022%20english.pdf> (last accessed 2 July 2020).

Appendices

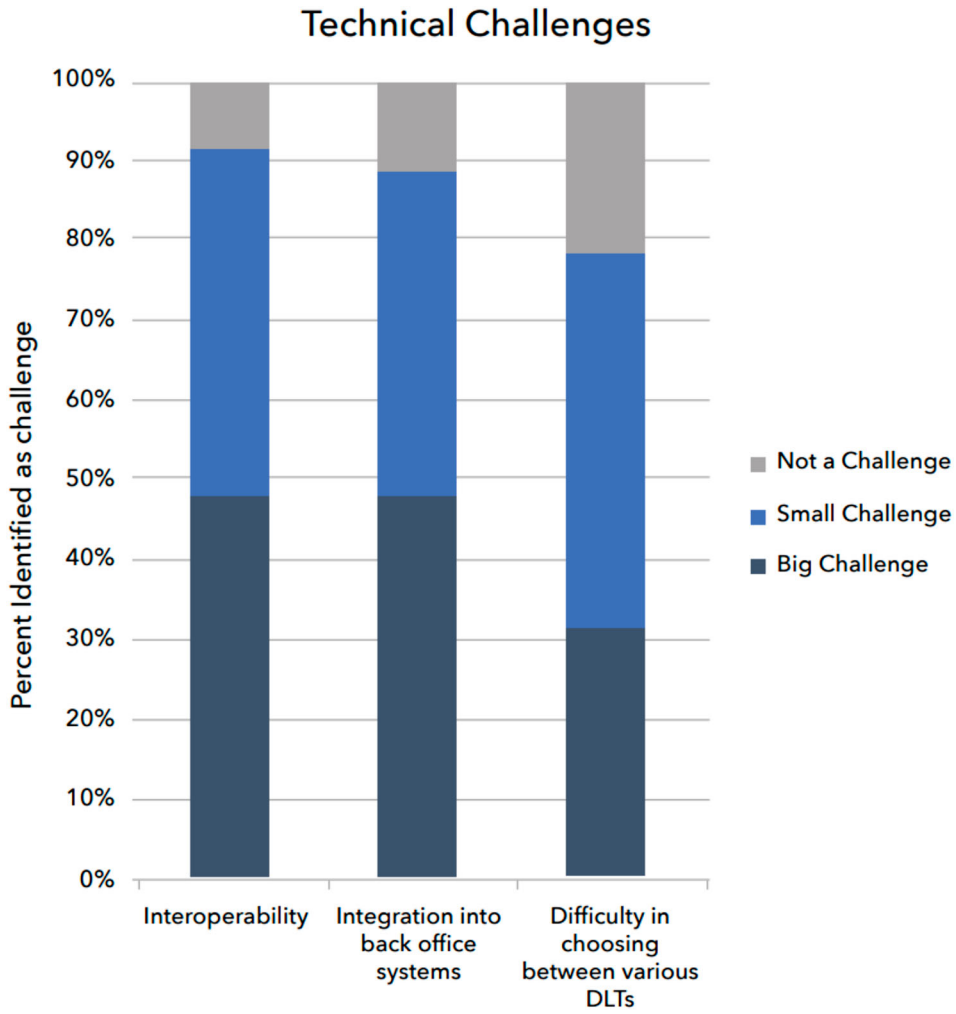
Appendix 1



Appendix 2



Appendix 3



Source for all three figures: *Trade Finance Global*, 2019 Study. Note: <https://www.tradefinanceglobal.com/wp-content/uploads/2019/11/Graph.pdf>.