



## DIGITAL BUSINESS

Process inefficiencies in payment methods like letters of credit often undermine the ability to mitigate risk. But by modeling payments as self-executing contracts on blockchain, parties across the trade finance continuum could automate contract compliance and ensure faster assured payments by preventing disputes that arise from ambiguities in payment contract terms and conditions.

## **EXECUTIVE SUMMARY**

Payment settlement methods such as letters of credit (LC) and documentary collection have historically provided effective risk mitigation for trading parties through bank facilitation in the trade finance process. However, these activities still account for less than one-fifth of international trade due to their associated high costs, contractual delays and process complexities. Between the two, LC is the more widely used, accounting for approximately 12%<sup>2</sup> of all trade transactions. LCs have frequently been described as the lifeblood of global trade, but their value can be seriously limited by the risks and inefficiencies in the current process.

Inefficiencies have increased the time and cost of the LC issuance and verification process, making it less attractive for trading parties, especially for low-value transactions, and have contributed to the rise of open account trade, which disintermediates banks from the process. The findings of the 2017 Trade Finance report released by the International Chamber of Commerce's (ICC) Banking Commission<sup>3</sup> reaffirm the decline in LC and the

continued shift toward open account, with 80% of survey respondents indicating limited growth or a decline in LCs going forward (see Figure 1).

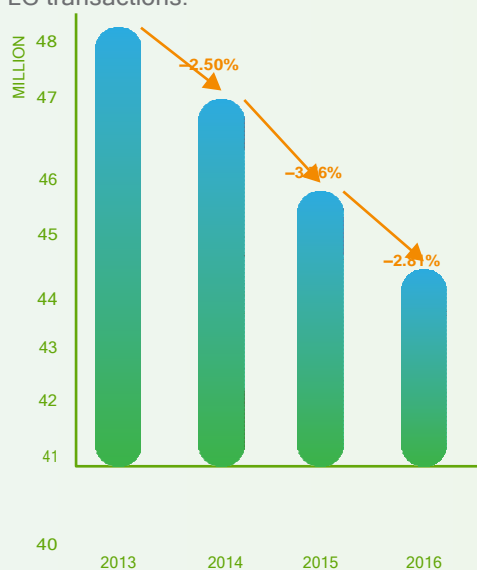
Blockchain technology has the potential to eliminate these inefficiencies by automating payment methods such as LC to streamline

business processes, reduce operational complexity and reduce transaction costs.

This white paper, the second<sup>4</sup> in our blockchain applicability in trade finance series, provides a deep dive into how the key LC pain points can be treated through blockchain implementation.

### Letters of Credit Plummet

For the past three years, there has been a steady decline in the volume of MT700s, which account for approximately 90% of all LC transactions.



Source: SWIFT Trade Traffic (from "Rethinking Trade & Finance," ICC, 2017).

Figure 1

## CURRENT PROCESS CHALLENGES

Because LCs are evaluated on the basis of trade documents and not the actual delivery or quality of goods, errors in terminology and interpretation of the compliance requirements often lead to disputes between trading parties. As a result, goods can sit unclaimed at a delivery location as the parties negotiate a way forward. To understand why these differences occur, we need to take a deeper look at how an LC contract is structured.

As a payment commitment made by the issuing bank (buyer's bank) to the seller, the LC is preceded by two other trade contracts:

- The sales contract between the buyer and the seller, outlining the terms of trade.
- The promise by the buyer to reimburse the issuing bank for duly honoring a “compliant” LC submitted by the seller.

The latter also obligates the bank to ensure that the documents presented by the seller completely adhere to the LC terms and conditions, so the bank cannot unilaterally overlook or waive even the smallest discrepancy. At the same time, the LC independence principle<sup>5</sup> renders the bank's obligation to the seller independent of the seller's obligation to the buyer. Therefore, even if the sales contract terms have been breached, the bank is required to pay the seller as long as the LC terms and conditions have been met. Thus, the issuing bank must carefully evaluate whether the documents submitted by the seller comply with the LC. For numerous reasons, this can lead to process inefficiencies for all participants, as well as delayed or denied payments for the seller (see Figure 2, next page).

### Payment Disputes Due to Contractual Ambiguities

Interpreting the semantic ambiguities of the legal clauses in the LC contract usually necessitates discretionary determination by the bank. If the bank checks only for substantial or reasonable compliance with LC terms, then it risks waiving a material deviation and, in doing so, fails to honor its contractual obligation to the buyer. To avoid this, banks more often adopt the strict compliance standard, which mandates compliance with the LC both in spirit and in letter. However, this can lead to payment disputes or denial even on the basis of trivial ambiguities despite the seller's fulfillment of performance requirements under the sales contract.

## Letters of Credit Pain Points

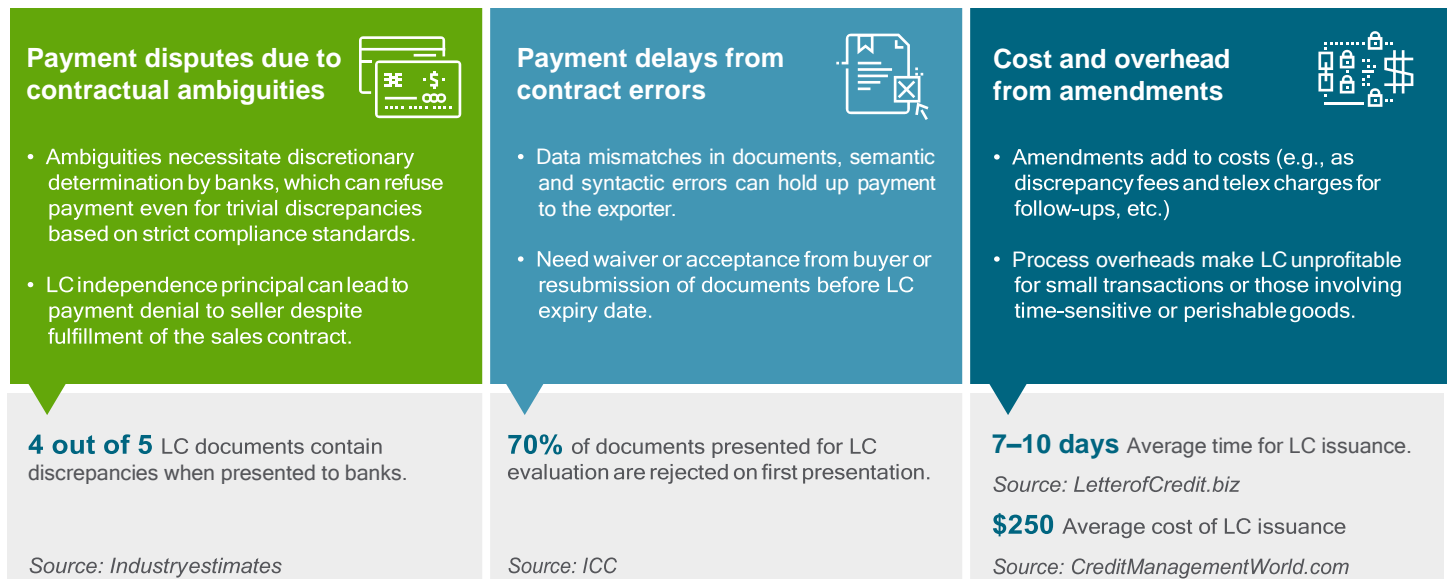


Figure 2

Consider a hypothetical international trade transaction involving the transport of goods by sea. If the LC specifies that the shipment is to be effected “in the beginning of the month of September,” different parties could translate this timeframe in many different ways (see Figure 3). Similarly, conditions calling for “competent” or “well-known” issuers of the document, or actions that need to be taken “as soon as possible” or “promptly,” all require discretion, as well.

### Letter of Credit Ambiguities: A Case in Point

International Trade Transaction (hypothetical example)		Difference in Interpretation	
Term	Condition	Seller	Bank
Shipment date	Beginning of the month of September	September 1-10	First week of September
Earliest delivery date	After September 18	September 18	September 19
Maturity date	30 days from or after the actual shipment date (September 1)	September 30	October 1
Document issue	From “competent or well-known party”	Party X acceptable	Party X is not acceptable

Figure 3

Although the UCP 600<sup>6</sup> has attempted to increase the flexibility of strict compliance rules and provide some guidelines for interpreting the compliance conditions, instances of misunderstandings and varied interpretation still abound. By some estimates, more than four of five<sup>7</sup> letters of credit documents contain potential ambiguities when presented to banks.

### Payment Delays from Data Errors in the Contract

In addition to ambiguities, LC contracts can also contain data mismatches or related discrepancies. In the case of tulips exported from the Netherlands to New Jersey, for example, it could be considered a discrepancy if the LC referred to the shipped consignment as “tulips” and the inspection document called them “Dutch tulips” or even “tulipia,” their scientific name. If the importer is referred to as “Jonathan & Co Limited” instead of “Jonathan Co. Limited,” it could also be considered a material discrepancy. All these discrepancies require the buyer’s approval to be waived.

Given the possibilities for terminology related and typographical mistakes and oversights by various parties, mismatches can easily occur in LC and Trade documents. An ICC study indicates that between 60% and 70% of documents presented for LC evaluation are rejected on the first presentation due to such discrepancies.

Given the possibilities for terminology-related and typographical mistakes and oversights by various parties, mismatches can easily occur in LC and trade documents. An ICC study indicates that between 60% and 70%<sup>8</sup> of documents presented for LC evaluation are rejected on the first presentation due to such discrepancies. These statistics are not surprising given that even errors or ambiguities in presentation and grammar, including spelling and punctuation, can be considered discrepancies.

### How LC Amendments Increase Costs and Overhead

Ambiguities and discrepancies that cannot be waived - e.g., those involving change in the exporter's (sellers) address – require amendments in the LC contract, the sales contract or both. All such waivers and amendments also need to be completed within a short window before the LC expiration date. A majority of LCs today are issued through SWIFT as MT700 messages rather than as paper contracts. But even then, an average LC easily costs several hundred dollars and requires seven to 10 days<sup>9</sup> after documents are submitted for processing and payout. Any changes, waivers or amendments add to these costs (e.g., as discrepancy fees or telex charges for follow-ups) and delays, making this method unprofitable for small transactions or those involving time-sensitive or perishable goods.

Though several efforts have been made to digitize LCs, most have not been successful at mitigating these pain points due to data matching and authentication challenges, as well as a lack of integration with the overall trade process, or failure to bring all stakeholders onto a common centralized platform.

## A BLOCKCHAIN SOLUTION

Using blockchain, an LC can be modeled as a smart contract between the financier and the supplier to guarantee payment to the latter – if the trade merchandise is delivered to the buyer in accordance with all specified conditions (see Figure 4). A blockchain smart contract codifies the terms and conditions of trade. This is done by abstracting and expressing conditional clauses – regarding the time, place and manner of shipment and delivery, the description and quantity of the goods shipped and the documentary evidence required for verification – as separate, independent or interdependent functions that provide pass/fail outputs based on the input information.

Based on the documents submitted by the exporter, evaluating and verifying that the LC conditions meet specified shipment deadlines can be automated through program logic to indicate compliance or non-compliance for each case.

### Letter of Credit Process Flow

Payment methods like LC and the underlying trade contracts can be modeled as smart contracts on a blockchain to provide payment certainty to the seller.

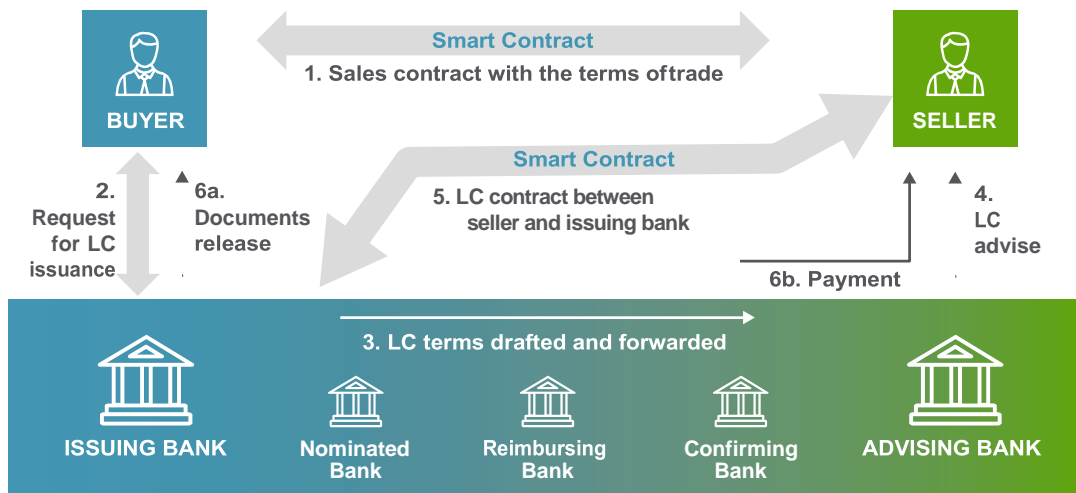


Figure 4



The network consensus mechanism ensures there is only one single final version of the LC draft at any given time and that all parties are able to view and work on this version based on their access rights.

The LC is issued on a distributed ledger technology (DLT)<sup>10</sup> network consisting of buyer, seller, facilitating banks (including the issuing, advising, confirming, nominating, reimbursing and correspondent banks) and other trade finance entities acting as participating nodes. The LC terms and conditions can be drawn by the importer and stored immutably on the blockchain network as a draft. This draft is first made visible to the issuing bank, which, after reviewing and underwriting the LC application, can digitally sign it to confirm its approval.

Similarly, the LC can be sequentially reviewed and approved by other participating banks, including the advising bank, before being forwarded to the exporter. The network consensus mechanism ensures there is only one single final version of the LC draft at any given time and that all parties are able to view and work on this version based on their access rights. After being reviewed and accepted by the exporter, the LC is finalized as a contract between the issuing bank and the exporter. Amendments or updates to the LC can be managed through a similar multi-signatory mechanism, providing approval and viewing permissions to buyer, seller and participant banks based on the nature of the required change.

## **BLOCKCHAIN BENEFITS: PAYMENT ASSURANCE TO SELLER**

Payment method automation on blockchain ensures faster assured payments by preventing disputes arising from contract ambiguities, which reduces payment delays through early discovery of discrepancies and decreases the expense and difficulty of making amendments due to discrepancies (see Figure 5).

## Blockchain Benefits

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Figure 5

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Phrases like “beginning of the month” and “as soon as” are replaced by discrete date and time ranges to clearly specify the allowed dates for shipment, delivery, payment, etc. Through smart contracts, each condition can be evaluated based on the documents submitted by the exporter, effectively removing ambiguities and, consequently, the need for discretion by the issuing bank.

#### How Smart Contracts Reduce Contractual Ambiguities and Errors

Specifying LC requirements as logical and verifiable conditions in the smart contract-based template compels exactness and precision regarding time, place, value and manner of shipment while drafting the LC. For example, phrases like “beginning of the month” and “as soon as” are replaced by discrete date and time ranges to clearly specify the allowed dates for shipment, delivery, payment, etc. Through smart contracts, each condition can be evaluated based on the documents submitted by the exporter, effectively removing ambiguities and, consequently, the need for discretion by the issuing bank.

Also, by modeling the preceding sales contract between the buyer and seller as smart contracts, as well as the agreement between the buyer and the issuing bank, data discrepancies can be further prevented in the LC contract, as key data elements such as goods description, parties’ names, etc. can be picked up directly from the underlying contract. This would ensure uniformity in description – so goods such as “tulips” would be referred to either as “tulips” or “Dutch tulips” across all the transaction-related documents, and similarly, the importer would be referred to in a uniform way throughout the trade lifecycle – reducing data errors.

Since all trading and facilitating parties also have visibility into the LC issuance process on blockchain — and clear oversight into the current status of the pending actions — potential discrepancies can be more quickly identified.

### Early Discovery of Discrepancies through Data Sharing

Since all trading and facilitating parties also have visibility into the LC issuance process on blockchain and clear oversight into the current status of the pending actions – potential discrepancies can be more quickly identified. Moreover, any required amendments or corrections can also be conducted earlier in the process rather than after presentment to the issuing bank. For example, if the shipment is delayed by a couple of weeks, the implications can be dealt with in real-time; the buyer can either permit the bank to waive this discrepancy in the shipping date (and its consequent impact on the delivery and payment dates), or the buyer and seller can agree to modify other terms of trade and create an LC amendment.

The point here is that these discussions can be initiated and decisions made ahead of presentment instead of after the discrepant documents are rejected by the issuing bank. This will help to reduce the time taken for bank evaluation and also speed delivery, freeing funds for the seller's working capital needs. Overall, if the LC specifies a number of conditions that need to be fulfilled, at any given time, all parties can see which ones have been successfully completed, rejected or are pending, leading to timely risk management and better internal forecasting. This saves time and eliminates additional costs for trading parties for long-drawn disputes.

In many cases, this approach might also be the only way to prevent non-payment. For instance, while internal documents can be adjusted at a later stage for compliance with LCs, this might not always be possible in the case of third-party documents, such as bill of lading, since a post-shipment change to bill of lading is tantamount to perpetration of fraud in some countries.



Blockchain technology eliminates the need for physical presentation of documents, making the process faster and more transparent for trading parties. It also ensures that all participants have visibility into the process and can peruse the documents presented by the seller.

#### **Digitizing Workflow to Reduce LC Amendment Time and Costs**

Another blockchain advantage is that it substantially reduces the time and cost for LC issuance, as well as for any buyer waivers or amendments made due to discrepancies. Through the multi-signatory mechanism, any changes required can be instantly approved or countered by the relevant parties, and the updates are visible to all stakeholders in real-time.

In contrast with the paper-based or SWIFT LCs that are primarily meant to be bilateral, inter-bank communication mechanisms, this approach substantially reduces the time taken to issue and update an LC. Proofs of concept (PoC) for LC automation via smart contracts have reduced execution times from weeks and days to a few hours.<sup>11</sup> For instance, if the importer's address has changed, an amendment can be proposed by the importer, reviewed and approved by the exporter and issuing bank, incorporated in the LC and shared with all other stakeholders. All other documents, including the sales contract, that use this data input field would automatically also be flagged for update and modified in a similar manner to avoid discrepancies.

While LC is the most common payment method and involves greater bank participation compared with other methods, blockchain's benefits accrue similarly for payment methods such as documents against payment (D/P) and documents against acceptance (D/A). Blockchain technology eliminates the need for physical presentation of documents, making the process faster and more transparent for trading parties. It also ensures that all participants have visibility into the process and can peruse the documents presented by the seller.

## LOOKING FORWARD

By effectively dealing with their pain points, blockchain holds the potential to make trade finance payment methods more efficient, reliable and profitable for all trading parties and increase their indispensability for risk mitigation in international trade.

In the short term, blockchain technology reduces process inefficiencies by digitizing the documentary evaluation of LC. In the long term, the maturity and ubiquity of blockchain processes and ecosystems promise a more holistic view of information flows, completely obviating the need for document-based evaluation and financing, and instead enabling LC evaluation and financing to be based on asset movement and other contractual milestones. For example, rather than an inspection report, the LC condition for a perishable shipment could be based on the shipping temperature not exceeding the recommended range throughout transportation and fund disbursement to a small or medium-size enterprise.

Given the potential benefits of blockchain technology in this space, banks and other parties in the broader trade finance ecosystem must start exploring and assessing its application through focused use cases. Doing so would build understanding and acceptance for implementing comprehensive business solutions that bridge blockchain process efficiency promises with the tough realities of integrating core banking systems in blockchain-based trade finance networks.



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## FOOTNOTES

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- <sup>1</sup> "Treatment of Trade Finance under the Basel Capital Framework," Bank for International Settlements, October 2011, [www.bis.org/publ/bcbs205.pdf](http://www.bis.org/publ/bcbs205.pdf).
- <sup>2</sup> Friederike Niepmann, Tim Schmidt-Eisenlohr, "Trade Finance Around the World," Vox, June 11, 2016, [voxeu.org/article/trade-finance-around-world](http://voxeu.org/article/trade-finance-around-world).
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- <sup>4</sup> Yan Hao and Ling Xiao, "Risk Analysis for Letter of Credit," International Journal of Business and Social Science, August 2013, [ijbssnet.com/journals/Vol\\_4\\_No\\_9\\_August\\_2013/20.pdf](http://ijbssnet.com/journals/Vol_4_No_9_August_2013/20.pdf).
- <sup>5</sup> The UCP (Uniform Customs & Practice for Documentary Credits) is a body of rules on use of letters of credit issued by the ICC (International Chamber of Commerce), The UCP600 is a revised version as of July 1, 2007.
- <sup>6</sup> Mark Hayward, "The Top Five Problems with Letters of Credit," Strong & Herd, October 2011, [www.strongandherd.co.uk/international-trade-articles/international-trade-article-problems-with-letters-of-credit/](http://www.strongandherd.co.uk/international-trade-articles/international-trade-article-problems-with-letters-of-credit/).
- <sup>7</sup> "Recent Development: Letter of Credit Transactions," Pepper Hamilton LLP, July 14, 2005, [www.pepperlaw.com/publications/recent-developments-letter-of-credit-transactions-2005-07-14/](http://www.pepperlaw.com/publications/recent-developments-letter-of-credit-transactions-2005-07-14/).
- <sup>8</sup> "At Sight Letter of Credit," LetterofCredit, [www.letterofcredit.biz/at\\_sight\\_letter\\_of\\_credit.html](http://www.letterofcredit.biz/at_sight_letter_of_credit.html).
- <sup>9</sup> In this paper, we have used blockchain and distributed ledger technology (DLT) interchangeably. Blockchain is a specific type of DLT in which blocks of transactions are cryptographically linked together. Enterprise platforms like Corda are examples of non-blockchain DLT systems that provide localized (deal-level) consensus and limited (on a need-to-know basis) data sharing.
- <sup>10</sup> Melodie Michel, "First Live Blockchain Transaction Conducted," Global Trade Review, July 9, 2016, [www.gtreview.com/news/global/first-live-blockchain-trade-transaction-conducted/](http://www.gtreview.com/news/global/first-live-blockchain-trade-transaction-conducted/).

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# Hashcash Consultants

## ABOUT HASHCASH CONSULTANTS BLOCKCHAIN AND DISTRIBUTED LEDGER CONSULTING PRACTICE

HashCash's Blockchain and Distributed Ledger Consulting Practice offers advisory, consulting and blockchain implementation services to organizations across industries. We uniquely bring together deep industry experience, extensive blockchain technical expertise, and intimate knowledge of the enterprise IT environment to guide our clients' journeys from prototype and pilot through production. Our collaboration with the industry's leading lights, combined with hands-on expertise with both open source and proprietary frameworks, gives us the business and technological capabilities to assist organizations industry-wide in their efforts to make blockchain a value-yielding and depend-able shared infrastructure solution across the extended enterprise.

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