

# Regulated Liability Network (RLN)

A potential strategic roadmap for cross-border payments

April 2023



Building a better  
working world

# Contents

<b>Introduction</b>	<b>1</b>	<b>Appendix A: Global frameworks and targets around payments</b>	<b>20</b>
<b>Executive summary</b>	<b>2</b>	<b>Appendix B: Digital assets comparison analysis</b>	<b>28</b>
<b>Chapter 1: Global payments – growing in importance and ripe for change</b>	<b>4</b>	<b>Appendix C: Solutions comparison analysis</b>	<b>31</b>
1.1 Global cross-border payments are critical to the global economy	5	<b>Key contacts</b>	<b>33</b>
1.2 Further transformation is needed	5		
1.3 Demand for change ahead	5		
<b>Chapter 2: What is the RLN and why can it transform cross-border payments?</b>	<b>6</b>		
2.1 What is the Regulated Liability Network (RLN)?	7		
2.2 The RLN vision – how does it work in practice?	8		
2.3 The benefits of the RLN	8		
2.4 What does the RLN mean for the future of global cross-border payments?	8		
2.5 The RLN concept is technically feasible – pilot outcome	12		
<b>Chapter 3: The problems the RLN could solve</b>	<b>13</b>		
3.1 The multinational corporates' perspective	15		
3.2 The banks' perspective	16		
3.3 Financial Market Infrastructure's (FMI) perspective	17		
<b>Chapter 4: What's needed to make the RLN a reality?</b>	<b>18</b>		
4.1 The opportunity to bring the RLN to life	19		
4.2 The four key next steps	19		



# Introduction

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The value of international payments continues to rise and is expected to be US\$250t in 2027.<sup>1</sup> Yet cross-border business to business (B2B) payments still tend to be slow, generate high transaction charges, and are considerably less transparent than domestic payments.

Unsurprisingly, there is significant industry focus on enhancing cross-border payments. We have already seen change, such as Swift global payment innovation (gpi), which allows payments processing in less than two hours on average. Banks and central banks around the world are also starting to recognize the potential of digital assets, cryptocurrencies and Distributed Ledger Technology (DLT) or simply shared ledgers in facilitating a more significant change.

The Regulated Liability Network (RLN) could be a game-changer for cross-border payments, enabling instant settlement. It would create a new shared ledger for digital currencies that is “always on”, “programmable” and “multi-asset”.

RLN could become a new regulated Financial Market Infrastructure (FMI) operating a shared ledger, with central bank money, commercial bank money and electronic money on the same chain. It is designed to make cross-border payments more efficient, cheaper and faster while using regulated liabilities, such as tokenized commercial money. It has the potential for a new global settlement infrastructure based on regulated digital currencies.

Through RLN, wholesale payment rails based on tokenized liabilities could be developed, enabling instantaneous settlement of payments for various types of financial transactions, including domestic transactions. This would help banks to benefit from significant cost saving by providing a low-cost transaction medium, generating instant revenue from transaction cost. It could also manage fraud and data security through the DLT ledger.

This report looks at both the opportunities and challenges to establishing RLN. It contains insights from a UK pilot of several banks, which tested the Proof Of Concept (POC) of instant settlement for domestic and international (UK-US) transactions. The pilot also allowed for a better understanding of instant settlement and possible technical solutions needed, including potentially managing the speed and scale of 10,000 transactions per second.

It is increasingly clear that the high costs of cross-border payments, coupled with the availability of new technology, means the business case for such solutions is already strong. Next it would be critical to further define how the RLN could operate and the best way to bring that to life.

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<sup>1</sup> Bank of England, September 2022. [Find it here.](#)

# Executive summary

Cross-border payments are vital to the global economy and continue to rise in volume. Thanks to recent improvements, cross-border payments have come a long way in recent years – they are faster than ever, with more transparency and less friction in the process. A 2022 analysis by the Committee on Payments and Market Infrastructures (CPMI)<sup>1</sup> found that the median time for a cross-border payment to complete is just 1.5 hours, with the fastest routes seeing the majority of payments settled within minutes or even seconds. Enhanced payment tracking with Swift gpi has enabled this change, and the adoption of the ISO 20022 data model as a common standard for payment messaging should yield further benefit. But by their nature, cross-border payments are more complicated than domestic ones and there's still more progress to make, particularly in addressing the technical, regulatory and commercial barriers that are often the source of delays, such as lack of 24x7 availability, uncertain settlement timing and inconsistent data.

For corporates, it too often means delays and uncertainty around even internal bank transfers. For banks, trapped liquidity and high costs are taking away valuable revenue, while they struggle to offer customers transparent and fast services.

Given the scale and impact of complexities of cross-border payments, key players across the sector, from established institutions to FinTech companies, are

looking into alternative solutions, giving rise to a real boost of innovation. New and emerging technologies, such as digital assets and DLT, are increasingly being used as basis for this experimentation.

## What is the right next step?

The good news is that the industry understands change is needed. Leading bodies within the industry, such as the Financial Stability Board (FSB), Committee on Payments and Market Infrastructures (CPMI) and the Bank for International Settlements (BIS), have made clear what is needed to enhance cross-border transactions. Banks themselves have been busy looking at a range of different options, with various industry and commercial initiatives in process.

One area of real potential is the Regulated Liability Network (RLN), a proposed Financial Market Infrastructure, which operates a shared ledger with central bank money, commercial bank money and electronic money on the same chain. It has a number of partitions for each regulated entity to be able to store its liabilities.

This brings several advantages:

- ▶ Participants tokenize their liabilities in their partitions in real-time on a shared ledger as fungible digital assets tokens. They can be exchanged at par value and settled through central bank money.

- ▶ The RLN enables real-time 24x7 transfer and settlement of liabilities.
- ▶ Minting, burning and transfer of liabilities works across the end-to-end process.
- ▶ The RLN can be integrated in the existing ecosystem, without replacing existing players but interoperating with them.
- ▶ The RLN avoids the fragmentation caused by the development of individual “bank coins”.

## The RLN meets demand

The BIS has outlined 19 key areas that will help enhance cross-border transactions (see [Appendix A](#)). Our analysis shows how the RLN could meet each one, such as promoting safer payments, extending operating hours and improved access to payment systems. Critically we also looked at 12 key dimensions that customers value and again we found the RLN meets the majority of them, including trust, transparency, cost and interoperability.

A UK pilot conducted in collaboration with a number of financial institutions looked to test the POC of instant settlement for domestic and international (UK-US) transactions. The pilot met eight success criteria to prove technical feasibility including tokenization of participants' liabilities in their partitions in real-time, and the burning, minting and transferring of liabilities across the end-to-end process.

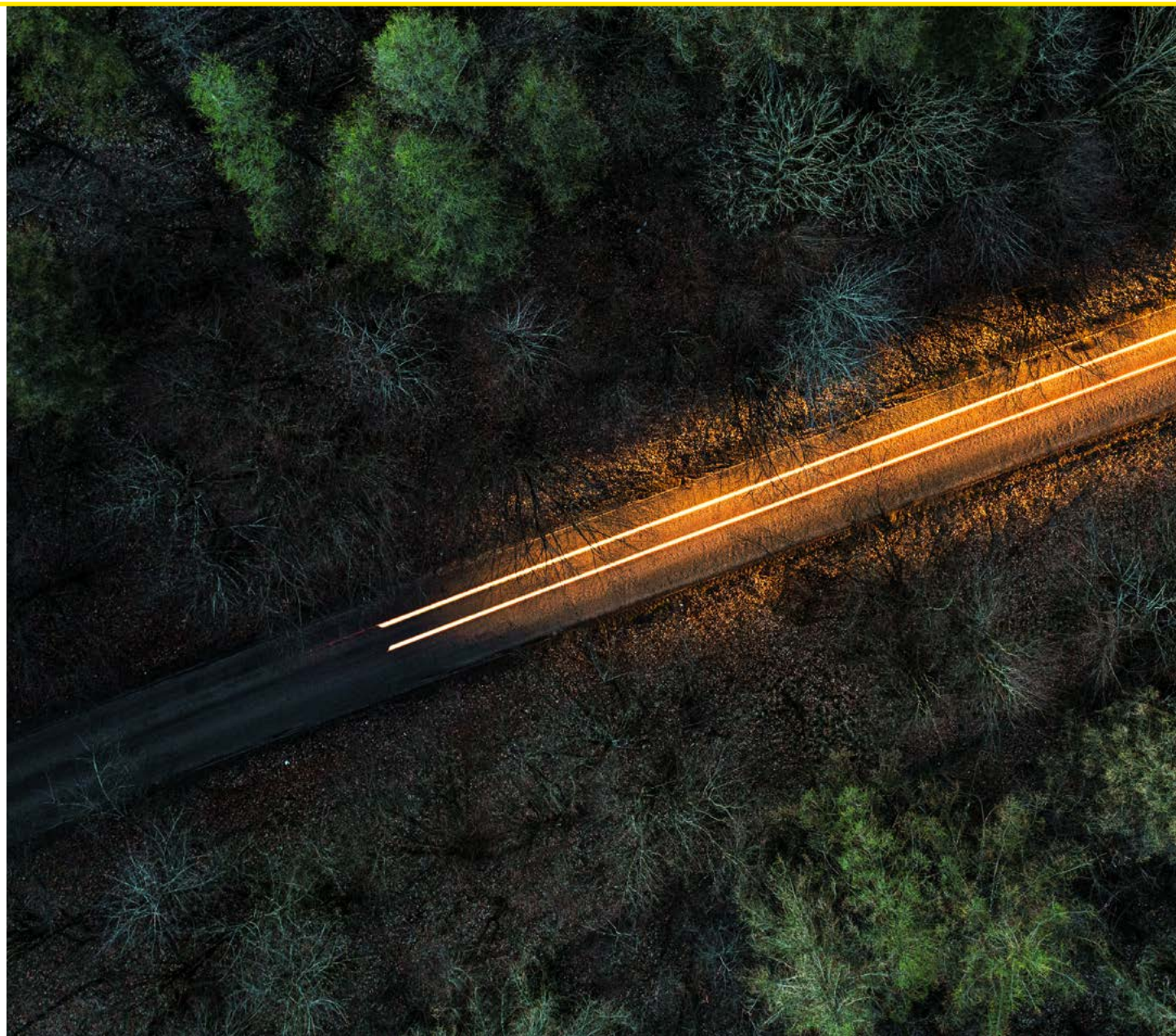
<sup>1</sup> CPMI, February 2022. [Find it here](#).

### The roadmap to success

There are numerous industry initiatives looking at differing concepts to improve cross-border payments. Now that we have validated the technical solution, there is a desire to finalize the concept of the RLN from a commercial, operational and legal perspective. This would support the move to a live production environment, and ultimately achieve a live transaction in the near future.

Reasons to be positive are that the RLN only includes regulated liabilities, hence no compromise to safety and soundness, and also that it can be implemented into existing market infrastructure. Critically, the pilot demonstrates it is technically feasible.

Its potential is clear. The industry is looking for a safe, secure and regulated alternative and the RLN has a big role to play. It can help bring global payments into the modern digital age. It would solve a range of problems impacting cross-border and domestic payments. It offers faster, cheaper and more transparent results for banks and corporate customers alike.



# 1

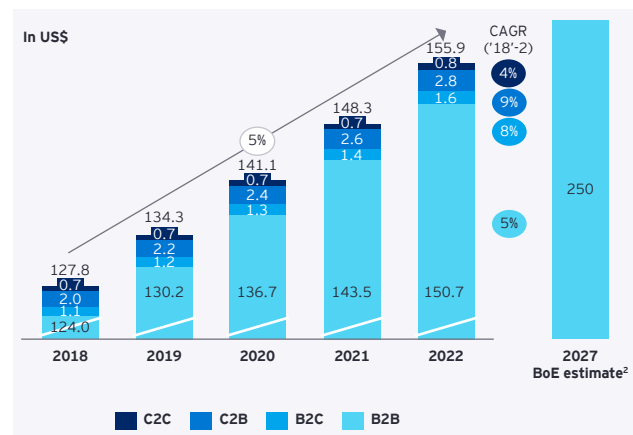
Global payments  
– growing in  
importance and  
ripe for change

### 1.1 Global cross-border payments are critical to the global economy

Cross-border payments value, 95% of which is wholesale, is expected to grow by 60% in the next five years.

International payments have long served as the engine that enables cross-border trade and investment and have been instrumental in the emergence of today's global economy. Wholesale payments represent 95% of total value of cross-border payments at US\$150t in 2022. This value is expected to grow and reach US\$250t by 2027.

Fig 1 **Cross-border payment flows worldwide in US\$ trillion for 2018-27<sup>1</sup>**



1 EY analysis, February 2021 (numbers of 2021/22 are estimates). [Find it here.](#)  
 2 Bank of England, September 2022. [Find it here.](#)

That growth is only likely to accelerate as we see:

- ▶ New emerging payment corridors and segments driving B2B volumes
- ▶ Growth in retail remittances driven by migration flows
- ▶ Growth in global e-commerce across all channels
- ▶ Innovation leveraging alternative payment rails and payment methods such as cryptocurrencies

### 1.2 Further transformation is needed

Although cross-border payments have become quick and transparent, with far less friction preventing them from arriving at their destination on time, there are still pain points in the process that need to be addressed – see [Chapter 3](#).

Added to this, the current cross-border payments infrastructure is seeing greater competition at all levels, from alternative providers and FinTechs to large, established players looking to offer solutions, and market infrastructures that are increasingly looking to connect and interoperate with each other to explore new ways of settling payments.

### 1.3 Demand for change ahead

Regulators, international organizations, large corporates, banks and Financial Markets Infrastructures are all pushing for major changes in cross-border transactions. (See [Appendix A](#) for a more detailed overview.)

- ▶ The G20 endorsed a roadmap, developed by the BIS, in coordination with the FSB, to enhance cross-border payments. It lays out a comprehensive set of actions covering 19 “building blocks” identified by the CPMI across five focus areas.
- ▶ The FSB set out global quantitative targets for addressing the four key challenges of cross-border payments (cost, speed, transparency and access).
- ▶ Many other international organizations including the BIS, International Monetary Fund (IMF) and the World Bank, are exploring solutions for strengthening digital currencies infrastructure.

They all share similar desirable outcomes including:

- ▶ Faster, more effective end-to-end processes
- ▶ Increased transparency and better visibility
- ▶ Cheaper, efficient and cost-effective payments
- ▶ Reduced risks with advanced risk management
- ▶ Strong interoperability and more inclusive

In the next chapter we explore why the RLN could be one of the solutions to help achieve these goals and transform cross-border payments.



# 2

What is the RLN and why can it transform cross-border payments?



## 2.1 What is the Regulated Liability Network?

The Regulated Liability Network (RLN) is positioned as a FMI, operating a shared ledger with central bank money, commercial bank money and electronic money on the same chain (see Fig 2). It has a number of partitions for each regulated entity to be able to store its liabilities.

RLN has six core characteristics:

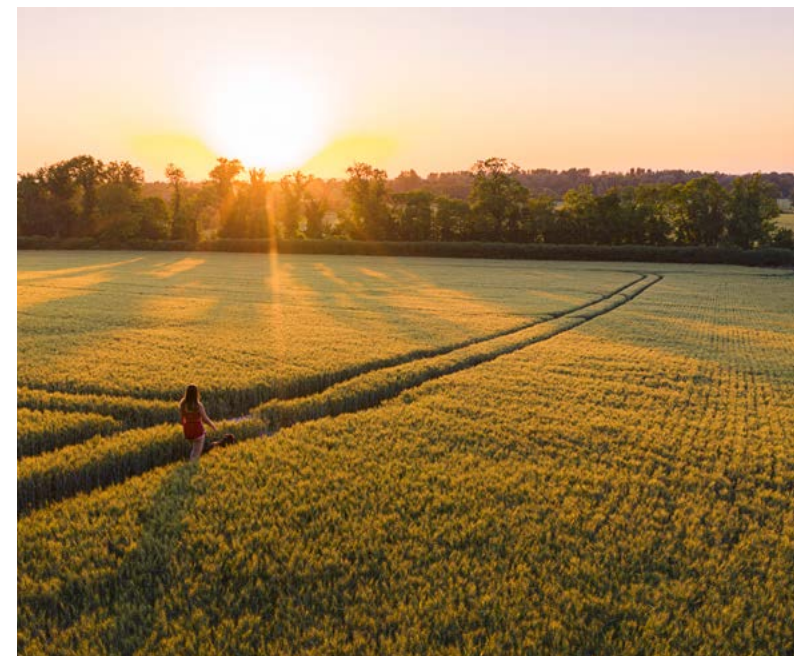
- ▶ **Regulated** – the RLN applies only to digital money that are considered “regulated liabilities”:
  - ▶ *Central bank money*: money issued by a central bank in the form of cash in circulation and bank reserves. This represents a liability of the central bank and is regulated.
  - ▶ *Commercial bank money*: money issued by a commercial bank and stored in accounts. This represents a liability of the commercial bank in favor of the depositor and is regulated.
  - ▶ *Electronic money*: money issued by a regulated non-bank, usually a payment company. This represents a liability of the non-bank in favor of the customer and is regulated.
  - ▶ *Public crypto*: cryptocurrencies issued via computer code and traded on exchanges and over-the-counter (OTC). These do not represent a liability to customer and therefore are not included as part of the RLN, unless subjected to regulations.

- ▶ *Stablecoins*: digital assets whose value is pegged to a commodity, currency or determined algorithmically. These do not represent a liability to customer and therefore are not included as part of the RLN, unless subjected to regulations.

- ▶ **Token-based** – the regulated liabilities are tokenized (i.e., digitally represented) and exchanged atomically over shared ledger, they are not a bearer instrument.
- ▶ **Multi-asset** – the RLN could support exchange and settlement of multiple types of assets, including different types of currencies and assets classes.
- ▶ **Programmable** – the RLN leverages the use of smart contracts to automate actions and support 24x7 settlement.
- ▶ **Global network** – the RLN is a global and inclusive initiative which supports domestic and international use cases.
- ▶ **Based on DLT** – the RLN leverages a shared ledger to provide a more powerful, efficient and secure settlement system.

Fig 2 **The RLN has a number of partitions for each regulated entity to be able to store its liabilities**

Regulated liability network FMI			
Central bank partitions <i>Central bank liabilities</i>	Commercial bank partitions <i>Commercial bank liabilities</i>	E-money partitions <i>E-Money liabilities</i>	Stablecoin partitions <i>Stablecoin liabilities</i>
			Subject to regulation



## 2.2 The RLN vision – how does it work in practice?

- ▶ The purpose of the RLN is to create a new substrate for sovereign currencies that is “always on,” “programmable” and “multi asset.”
- ▶ The network will deliver “on-chain” finality of settlement between the participating institutions in sovereign currencies.
- ▶ Each institution has a “partition”, the core partition is owned by the Central Bank: Central Bank Digital Currency (CBDC) – direct liabilities of the central bank.
- ▶ In the same RLN network there is a partition for each regulated private entity – for both banks and regulated non-banks.
- ▶ Participants tokenize their liabilities in their partitions in real-time on a shared ledger as fungible digital asset tokens that can be exchanged at par for a settlement asset. Minting, burning and transfer of liabilities works across the end-to-end process.
- ▶ The RLN can be integrated in the existing ecosystem, without replacing existing players but interoperating with them.

## 2.3 The benefits of the RLN

- ▶ The RLN would maintain the “two-tier” system – not only customer interface but also the balance sheet.
- ▶ It would defuse the disintermediation effect of “narrow” CBDC proposals.
- ▶ The RLN avoids the fragmentation caused by the development of individual “bank coins.”
- ▶ The RLN enables real-time 24x7 transfer and settlement of liabilities.
- ▶ The RLN is part of the next generation of multicurrency settlement infrastructure, addressing CPMI/BIS work on cross-border payments.
- ▶ It also explores less siloed financial system – multi-asset infrastructure.

## 2.4 What does the RLN mean for the future of global cross-border payments?

There are some clear benefits of the RLN for cross-border payments. The BIS has identified five areas and 19 sub-areas<sup>1</sup> that are required to improve cross-border payments (see [Appendix A](#) for a more detailed breakdown). The following table illustrates how the RLN is able to support all 19 building blocks set out by BIS, all aimed at enhancing cross-border payments:

<sup>1</sup> Enhancing cross-border payments: building blocks of a global roadmap, Bank for International Settlements report, July 2020. [Find it here](#)



BIS identified key building block to enhance cross-border payments		How the RLN meets and/or supports that criterion
1	Develop common cross-border payments vision and targets	Industry-wide, public/private partnership
2	Implement international guidance and principles	Operating in alignment with central banks and regulatory institutions' directives
3	Define common features of cross-border payment service levels	Close collaboration with industry representatives to define a rulebook for the solution
4	Align regulatory, supervisory and oversight frameworks	Creation of a FMI regulated by multiple collaborating supervisors
5	Apply Anti Money Laundering (AML)/ Combating the Financial Terrorism (CFT) rules consistently and comprehensively	Banks pre-validation of information is performed before transactions
6	Review interaction between data frameworks and cross-border payments	Data and instructions are securely stored on the network leveraging the ISO20022 data model
7	Promote safer payment corridors	Blockchain technology allows secure and reliable transfer thanks to the use of Public Key Infrastructure (PKI)
8	Foster Know-Your-Customer (KYC) and identity information-sharing	RLN to support on standardization of KYC practices
9	Facilitate increased adoption of Payment vs. Payment (PvP)	Enablement of atomic, 24x7 cross-border cross-currency transactions
10	Improve (direct) access to payment systems	Access to the network is granted via wallets issued by regulated banks and non-bank financial institutions

BIS identified key building block to enhance cross-border payments		How the RLN meets and/or supports that criterion
11	Explore reciprocal liquidity arrangements	Validate liquidity arrangements before settlement, then settle across parties instantaneously
12	Extend and align operating hours	Payments can be settled 24x7 by leveraging smart contracts
13	Pursue interlinking of payment systems	The RLN is a concept that would be deployed in a single regulatory environment and interoperable with other networks and RLNs
14	Adopt harmonized version of ISO 20022 for message formats	Close collaboration with Swift to comply to same formats and standards
15	Harmonize API protocols for data exchange	Close collaboration with industry and technology representatives to leverage the same APIs
16	Establish unique identifiers with proxy registries	Close collaboration with industry representatives to leverage the same unique identifiers and potentially to support proxy register on the network
17	Consider the feasibility of new multilateral platforms and arrangements for cross-border payments	The RLN is a new multilateral platform that allows interoperability with existing infrastructures and the broader ecosystem
18	Foster the soundness of global stablecoin arrangements	Support inclusion of stablecoins once regulatory requirements will be defined
19	Factor an international dimension into CBDC designs	Support inclusion of CBDCs



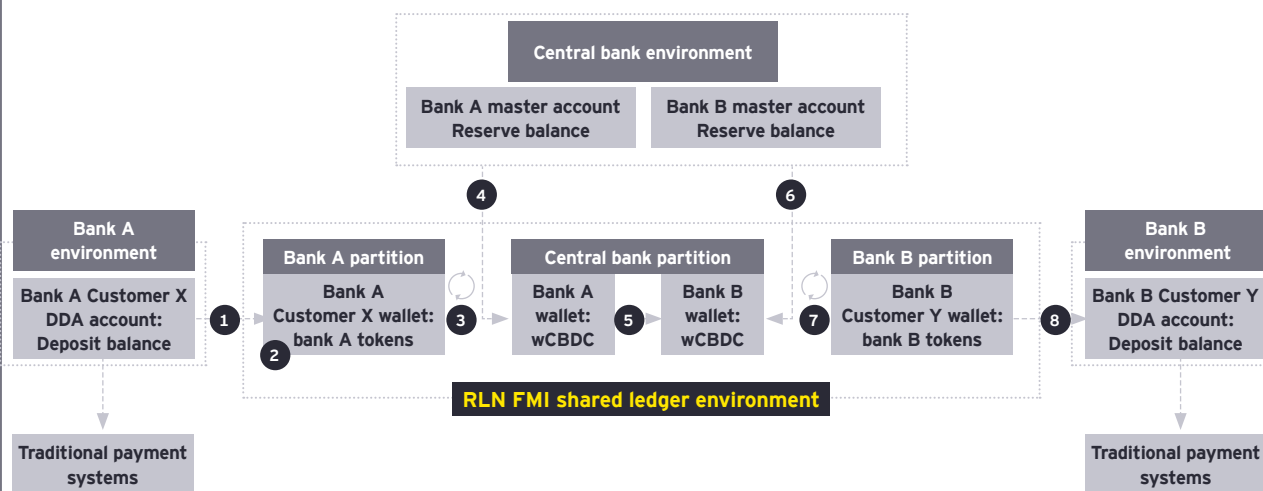
**The RLN also offers some significant other benefits including:**

- ▶ **“Always being on”** – the RLN supports 24x7 payments and settlement.
- ▶ **On-chain finality of settlement** – once the transactions are settled on-chain via the RLN, these are designed to be final from a legal standpoint, meaning that they cannot be unwound through insolvency procedures.
- ▶ **Smart contracts automation** – repetitive and manual actions such as conditional payments can be programmed and automated via the inclusion of smart contracts.
- ▶ **Liquidity optimization** – once transactions are validated, these are settled atomically, removing any delays in payments and releasing any trapped liquidity.
- ▶ **Instant settlement, no counterparty risk** – all counterparty risk is removed by settlement in central bank money; moreover all participants in the RLN are subject to KYC/AML/Sanctions screenings, and fund availability is checked before any transaction takes place. Once all the validation checks are complete, the transaction is settled instantaneously.
- ▶ **Single source of truth, not siloed** – the RLN leverages DLT meaning that every participant to the network only has access to the transactions which they are party to but shares a common ledger to record and settle transactions, effectively automating reconciliation.
- ▶ **Aligned to trusted, regulated environment** – the RLN only includes regulated liabilities, which can be exchanged on demand at par value in national currency, and leverage the DLT infrastructure.
- ▶ **Full audit trail** – all transactions in the RLN are recorded on a shared ledger, which cannot be amended.
- ▶ **Full interoperability** – the RLN allows for integration with different currencies, asset classes and players in the ecosystem.
- ▶ **No nostros/vostros reconciliations** – the presence of a shared record of transactions, which is updated constantly and in real-time, negates the need to perform offline accounts reconciliation.
- ▶ **Preventative controls** – participants to the network are subject to pre-screening procedures before being included in the RLN and transactions are pre-validated before taking place.
- ▶ **Real-time** – settlement and orchestration of liabilities happen in near real-time over DLT, significantly reducing any time lag and delay in the process.

### RLN – an example

This example represents the scenario in which two commercial banks are involved in a transaction and they both have access to central bank reserves.

Fig 3 **The steps involved to execute a transaction with two counterparties via the RLN**



### The transaction flow

- ▶ A customer of Bank A transfers some funds from their deposit balance to a RLN Token balance, via the electronic banking system of Bank A, and instructs a payment to a beneficiary at Bank B (Step 1 and 2).
- ▶ The RLN evaluates the ability to execute the end-to-end transaction, including performing KYC/AML/Sanctions screening checks, while Bank A evaluates that sufficient funds (i.e., wholesale CBDC) are available in their RLN Wallet to conduct the transaction (Step 3 and 4).
- ▶ The transfers of wholesale CBDC within the RLN environment is necessary to settle the transaction between Bank A and Bank B, which is done “atomically” (Step 5).
- ▶ Bank A, Bank B, and the Central Bank partitions are updated at the same time, and a single record is created of the settlement (Step 6 and 7).
- ▶ The beneficiary of the payment may transfer the RLN Token balance to their deposit account if they wish, via Bank B’s electronic banking system (Step 8).
- ▶ This is similar to the correspondent banking system in place today, however the RLN co-ordinates the minting, burning and movement of tokens, in real-time, into an atomic transaction which executes simultaneously across the network.

## 2.5 The RLN concept is technically feasible – pilot outcome

A UK pilot conducted in collaboration with a number of financial institutions looked to test the POC of instant settlement for domestic and international (UK-US) transactions. We were able to test technical feasibility through community testing and performance testing with a group of seven participants. We were also able to assess desirability and how the RLN can solve existing pain points for banks and multinationals.

### Technical feasibility

The UK pilot met eight success criteria to prove technical feasibility:

- ▶ **Tokenization** of participants' liabilities in their partitions in real-time, on a shared ledger, as fungible digital assets tokens that can be exchanged at par for a settlement asset.
- ▶ **Burn, mint and transfer** of liabilities across the end-to-end process.
- ▶ **ISO20022 messaging** initiation and Swift compatible PKI signature.
- ▶ Sender-based **real-time FX process** including RFQ.
- ▶ **Settlement finality** achieved by the exchange of the commercial bank liabilities, with simulated GBP and USD CBDC settlement tokens to enable a real-time transfer.

- ▶ Overall **security and resiliency** of the technical architecture data flows and trust boundaries validated as per defined assumptions.
- ▶ **Technical architecture's** throughput and performance validated as per pre-established assumptions.
- ▶ Ability to **interface effectively** through APIs and User Interface (UI) friendliness.

### Customer desirability

Working with the industry and using our sector knowledge, we established twelve key dimensions that customers are looking for when reviewing alternative solutions. We found the RLN met most of the twelve criteria:

1. **Trust** – can the assets used in the network be trusted?
2. **Public/private network** – can it interoperate with public blockchains?
3. **Transaction reversibility** – is the transaction final?
4. **Asset type** – is the type of asset a digital representation of fiat money or linked to it?
5. **Regulatory compliance** – are the assets currently regulated in the UK?
6. **Transparency** – is the transaction transparent so that regulated entities can take care of their AML/Sanctions responsibilities?

7. **Interoperability** – is it possible to move the type of asset from one party on one network to another on a completely different network with some degree of commonality?
8. **Usability** – are commercial banks using/trading this type of asset today?
9. **Authority** – are the assets primarily run by a decentralized authority, hence, limiting the power of a single institution?
10. **Interest-bearing** – are the assets currently offering interest to consumers?
11. **Timeframe** – are the assets facilitated on a 24x7 follow-the-sun model?
12. **Cost** – will the transactions be subjected to transaction fees?



# 3

## The problems the RLN could solve

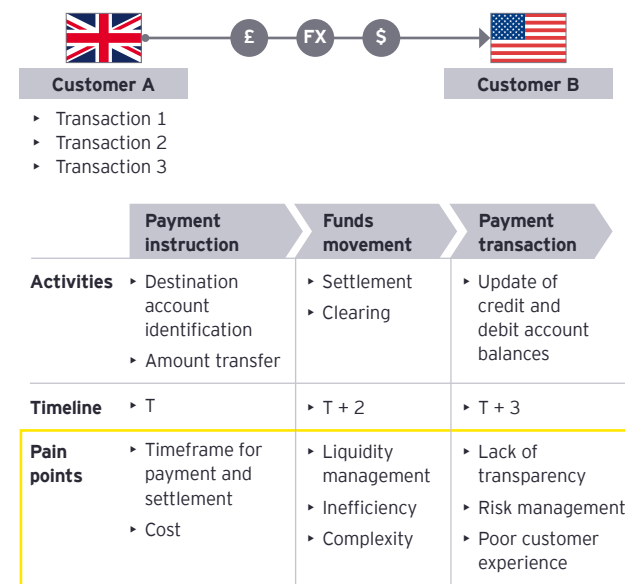


To show how the RLN could improve outcomes, below we look at a typical scenario today and show the pain points that could be alleviated for corporates, banks and FMIs.

As illustrated opposite (Fig 4), Customer A, a UK subsidiary of a global company, wants to send a number of transactions to Customer B, a US subsidiary of the same global company (i.e., internal transfer of funds). There are 3 steps involved:

- ▶ **Payment instruction:** The destination account is identified and the amount is being authorized for transfer.
- ▶ **Funds movement:** The funds are actually settled and cleared in the destination account. This happens after ca. 2 days from payment instruction day (T + 2).
- ▶ **Payment transaction:** Debit and credit balances are reconciled. This happens after ca. 3 days from payment instruction day (T + 3).

Fig 4 Internal transfer of funds process



Let's examine what this process means for corporates, banks and FMI.



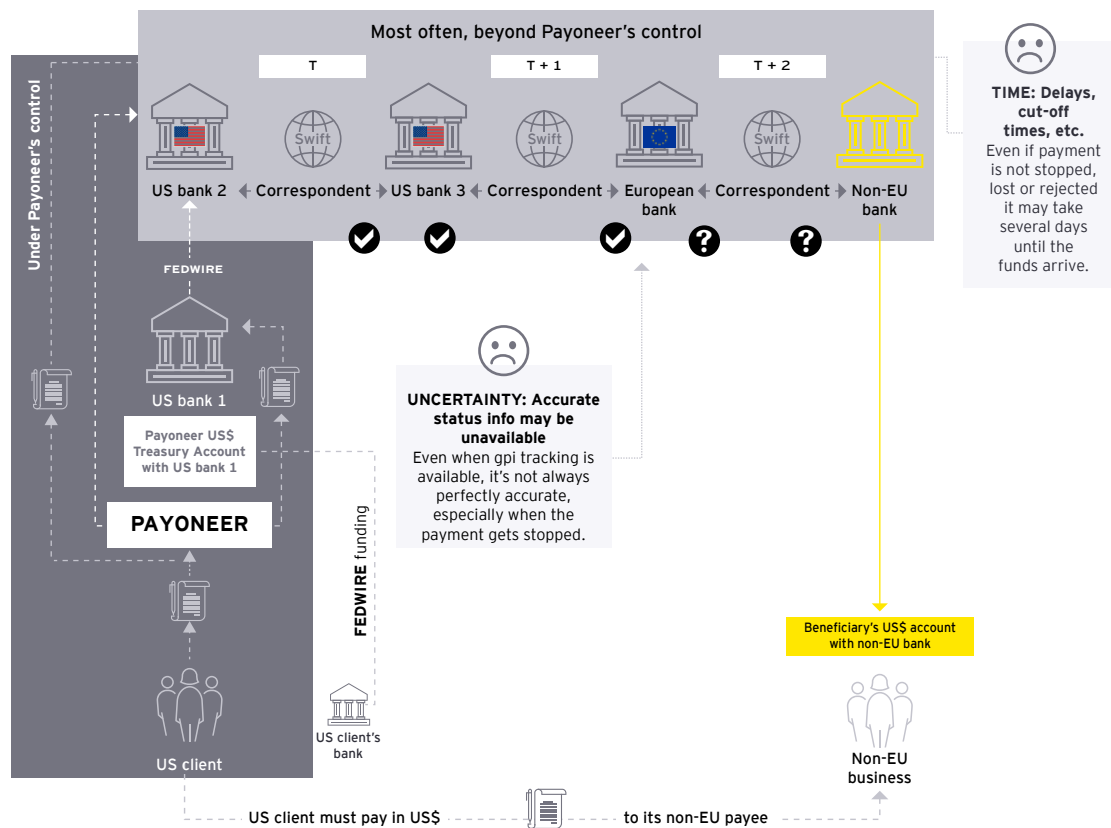
### 3.1 The multinational corporates' perspective

Many corporates view the current payment system as too fragmented and not transparent enough. They also struggle with liquidity and cash management, risk and speed. Common pain points include:

- ▶ Generally long wait times for a cross-border payment to arrive.
- ▶ Lack of accurate payment status information.
- ▶ Complications like lost/stuck or returned payments.
- ▶ Execution of payments often has to go through multiple schemes.
- ▶ The payer doesn't control the route and the route is often complicated and unknown until problems arise; i.e., a payments may get stuck in due to sanctions checking at a bank and the corporate would not know the reason for the delay.
- ▶ Foreign exchange (FX) verification goes through complicated systems, i.e., need to submit KYC/AML verifications at night time.
- ▶ FX funds take 1-2 days (deal request, verification, execution). This often leads to customer complaints, especially if there are delays or ultimately rejected payments.

Opposite is a real-life example of this process, using US firm Payoneer.

Fig 5 **Cross-border payments process flow from customer's perspective**



Source: Payoneer, 2022.

### 3.2 The banks' perspective

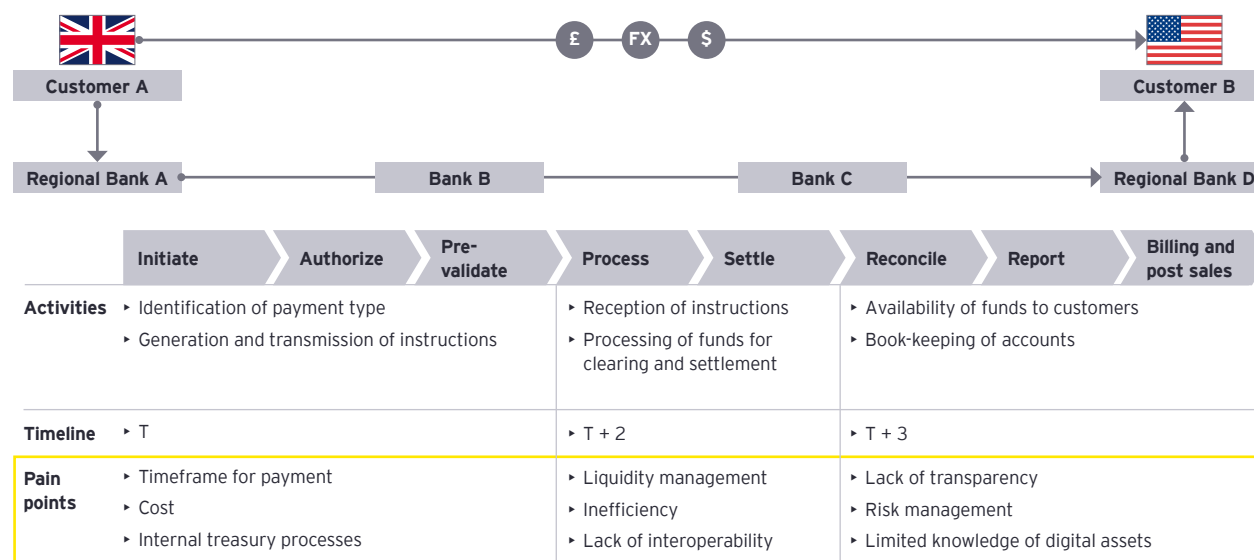
Similarly to corporates, banks are facing a number of pain points in the cross-border payments lifecycle. Banks' payments processes run in parallel with the customers' journey. As shown below, the process can involve numerous banks:

For banks there are several negative outcomes of this:

- ▶ **Cost** – the high cost of capital, the cost of transactions and fees as well as the cost for joining the networks (e.g., Swift and/or integration with other systems).

- ▶ **Inefficiencies** – there are multiple intermediary and steps in the end-to-end payment process. There is also replication of processes across functions and institutions (e.g., AML/KYC).
- ▶ **Risk management** – risk of adverse FX rates, settlement risk and Risk-Weighted Assets (RWA) credit risk. Banks also face counterparty and fraud risk.
- ▶ **Liquidity management** – liquidity is trapped in the process, giving rise to missed opportunities. Banks also often are required to pre-fund accounts to prevent delays in employees/suppliers payment.
- ▶ **Internal treasury processes** – banks need to process large batches with limited core netting capabilities (e.g., high volumes). This demands a high effort in reconciliation processes.
- ▶ **Protracted operational execution** – time is required to process payments, which disconnects with customers' expectations (e.g., shorter payment cycle).
- ▶ **Lack of transparency** – limited visibility and traceability of transactions and a lack of transparency for reporting, compliance and internal audit purposes.
- ▶ **Lack of interoperability** – limited interoperability with other networks and across digital assets and different messaging standards and data formats.

Fig 6 Internal transfer of funds process with additional bank complexity added

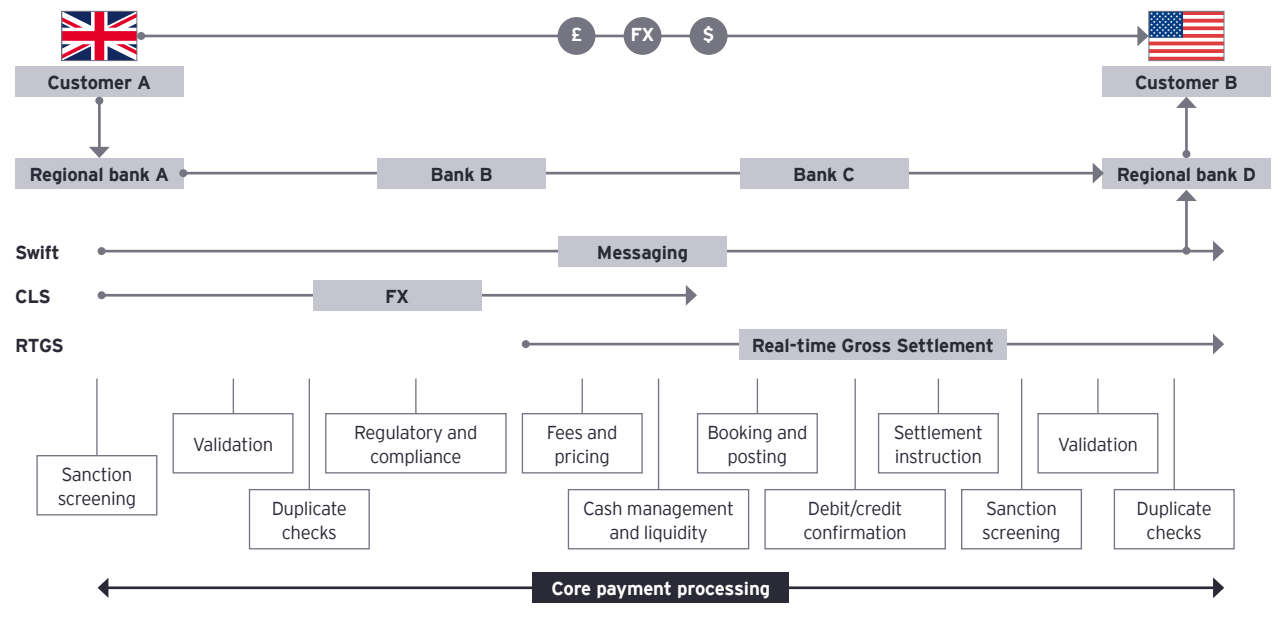


### 3.3 Financial Market Infrastructure's (FMI) perspective

A financial market infrastructure is composed of payment systems, securities clearing and settlement systems and payment instruments and is often labeled the plumbing of payments. As illustrated opposite, all these players also suffer pain points in the current system:

- ▶ There are a **number of intermediate and sometimes repetitive steps** (e.g., validation, sanction screening, fees and pricing, etc.) which are happening throughout the process adding complexity, delays and inefficiencies.
- ▶ It is a **complex ecosystem** as there are several players in the payments arena (e.g., Swift for messaging, CLS for FX, RTGS for real-time gross settlement).

Fig 7 Internal transfer of funds process – showing the complexity of FMI



FMI players are now trying to improve payments processes. For example, Swift launched “Swift global payment innovation (gpi)” to perform cross-border

payments in a quick and secure manner globally<sup>1</sup>. It offers traceability along the process as well as a median processing time of 1h 38min. See [Appendix A](#) for more information.

<sup>1</sup> CPMI, February 2022. [Find it here](#)

# 4

What's needed  
to make the RLN  
a reality?

#### **4.1 The opportunity to bring the RLN to life**

Banking in the last few years has been a story of technological innovation and change. Across retail and the back-office the sector has adopted and transformed to meet customer demand and offer cheaper, better services and products.

Cross-border payments, in contrast, has seen little real change in its use of technology in the last decades, let alone years. The RLN offers a transformation in approach. Financial institutions want a safe, secure and regulated alternative and are naturally attracted by the fact that the RLN only manages regulated liabilities. As the RLN can be implemented into the existing market infrastructure, coupled with the UK pilot demonstrating technical feasibility, there is a growing demand to develop the RLN to the live stage.

#### **4.2 The four key next steps**

During the next phase, participants will need to focus on exploring business viability including the commercial model as well as operational aspects of implementation. In addition, other use cases should be explored, including programmability and opening of additional payment channels.

While there is much to do before the RLN becomes a reality, we have identified four key areas that need addressing to ensure business and legal viability. Below are some of the top-line questions involved for each:

##### **1. Legal analysis and framework**

Key questions:

- ▶ What is the legal status of tokens and redemption obligations?
- ▶ How does the network integrate with existing legal requirements?

##### **2. Governance, onboarding and oversight**

Key questions:

- ▶ What are the rules of the RLN and how are they enforced?
- ▶ How can onboarding be made quick and simple for regulated entities to join the network?

##### **3. Commercial and operating model**

Key questions:

- ▶ What is the cost for developing the network/ integrating to existing infrastructures?
- ▶ How will the initiative be funded going forward?

##### **4. Technology design and sandbox expansion**

Key questions:

- ▶ How can the RLN integrate with existing and legacy architectures?
- ▶ What are the risks for integrating into the RLN and how can they be mitigated?

The tokenization of asset classes will revolutionize how capital markets operate. It will lead to a reduction in operating costs, new forms of liquidity, and programmability. The next phase is critical in refining the concept and defining the implementation roadmap for live deployment.



# A

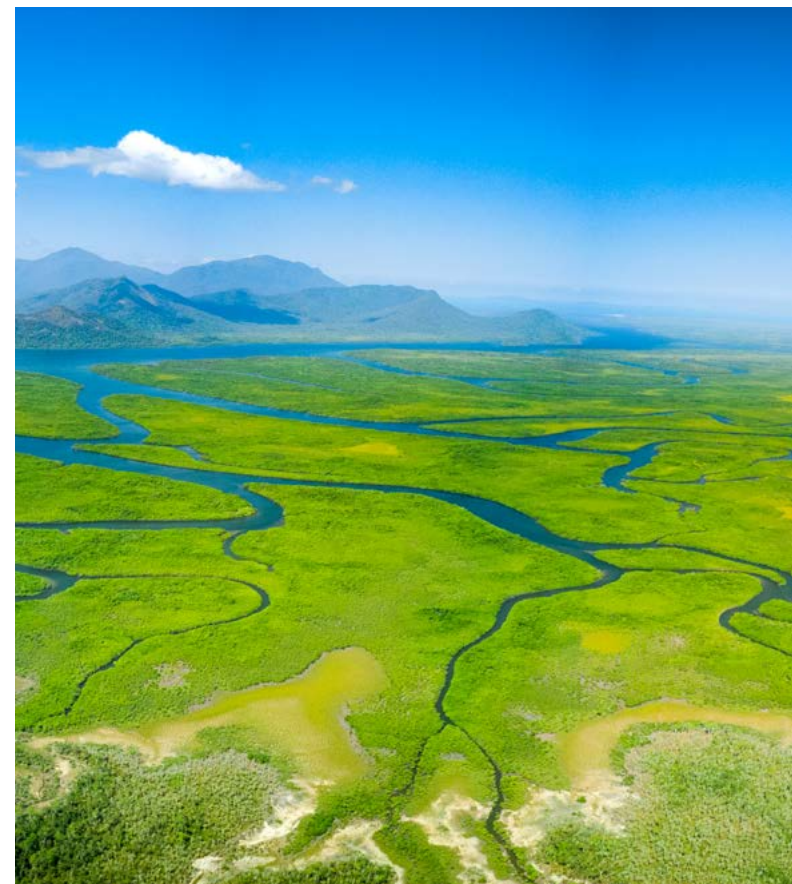
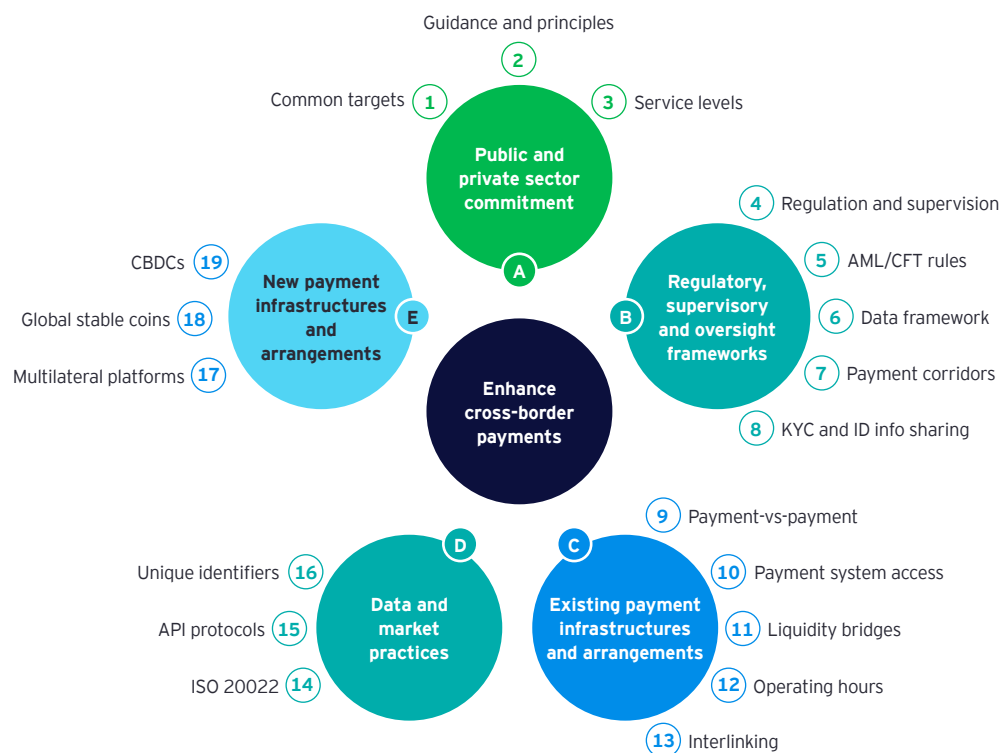
## Global frameworks and targets around payments

International organizations have set out targets and framework for payments. The BIS has identified five areas and 19 sub-areas required to improve cross-border payments.

The 19 building blocks are arranged into five focus areas:

- ▶ Focus areas A to D seek to enhance the existing payments ecosystem.
- ▶ Focus area E is more exploratory in nature and covers emerging payment infrastructures and arrangements.

Fig 8 **BIS 19 building blocks to enhance cross-border payments**



## **A Public and private sector commitment**

### **1. Develop common cross-border payments vision and targets**

Developing a common vision and expanding the range of agreed targets beyond remittance costs to include enabling faster, cheaper, more transparent and more inclusive payments for wholesale and retail alike.

### **2. Implement international guidance and principles**

Ensuring that international guidance and principles lead to the implementation of effective and efficient payment and Information and Communication Technology (ICT) infrastructures, and also lead to the achievement of agreed targets.

### **3. Define common features of cross-border payment service levels**

International guidance on, e.g., technical standards, settlement finality provisions, rules for the handling of exceptions to drive standardization and support competition and innovation in payment schemes.

## **B Regulatory, supervisory and oversight frameworks**

### **4. Align regulatory, supervisory and oversight frameworks**

Building on the principle of “same business, same risk, same rules.” Consistent jurisdictional approaches will ensure greater clarity for market participants.

### **5. Apply AML/CFT rules consistently and comprehensively**

Ensuring more effective and robust implementation and application of AML/CFT frameworks while continuing to pursue a risk-based approach.

### **6. Review interaction between data frameworks and cross-border payments**

Identifying and addressing real or perceived tension between financial regulatory requirements on the one hand, and restrictions on cross-border data flows and data storage on the other.

### **7. Promote safer payment corridors**

Reducing the burden associated with compliance checks and facilitating market entry to determine lower risk corridors and types of cross-border payments via rigorous and effective risk assessments.

### **8. Foster KYC and identity information-sharing**

Reducing the number of silos within and across jurisdictions to prevent identity duplication, ultimately benefiting both the end user and market participants.

## **C Existing payment infrastructures and arrangements**

### **9. Facilitate increased adoption of Payment vs Payment (PvP)**

Reducing settlement risk on the majority of FX transactions to help cross-border payments which rely on them.

### **10. Improve (direct) access to payment systems**

Broadening the range of eligible candidates for settlement accounts by changing access policies, technical standards and supervisory or oversight regimes.

### **11. Explore reciprocal liquidity arrangements**

Analyzing the feasibility of bilateral arrangements between large-value payment system operators and central banks to enable collateral posted in one jurisdiction to support liquidity issuance in another.





**12. Extend and align operating hours**

Adapting operating timetables for critical infrastructures and market participants to enable greater overlap of settlement windows.

**13. Pursue interlinking of payment systems**

Decreasing the dependency on traditional correspondent banking by establishing links between the payment infrastructures of different countries.

**D Data and market practices**

**14. Adopt harmonized version of ISO 20022 for message formats**

Promoting the adoption of common message formats, such as a harmonized version of ISO 20022 and common rules of mapping/converting data between different data formats.

**15. Harmonize API protocols for data exchange**

Harmonizing API protocols for data exchange across payment infrastructures and jurisdictions to enable more efficient payment data and digital identifier exchange in cross-border payments.

**16. Establish unique identifiers with proxy registries**

Providing a globally standardized approach supporting the global Legal Entity Identifier (LEI) for legal entities and a similarly standardized identifier for individuals.

**E New payment infrastructures and arrangements**

**17. Consider the feasibility of new multilateral platforms and arrangements for cross-border payments**

To complement or substitute traditional correspondent banking links or bilateral interlinking of the payment infrastructures of different countries, new multilateral cross-border payment platforms could address problems inherent in legacy technologies and processes.

**18. Foster the soundness of global stablecoin arrangements**

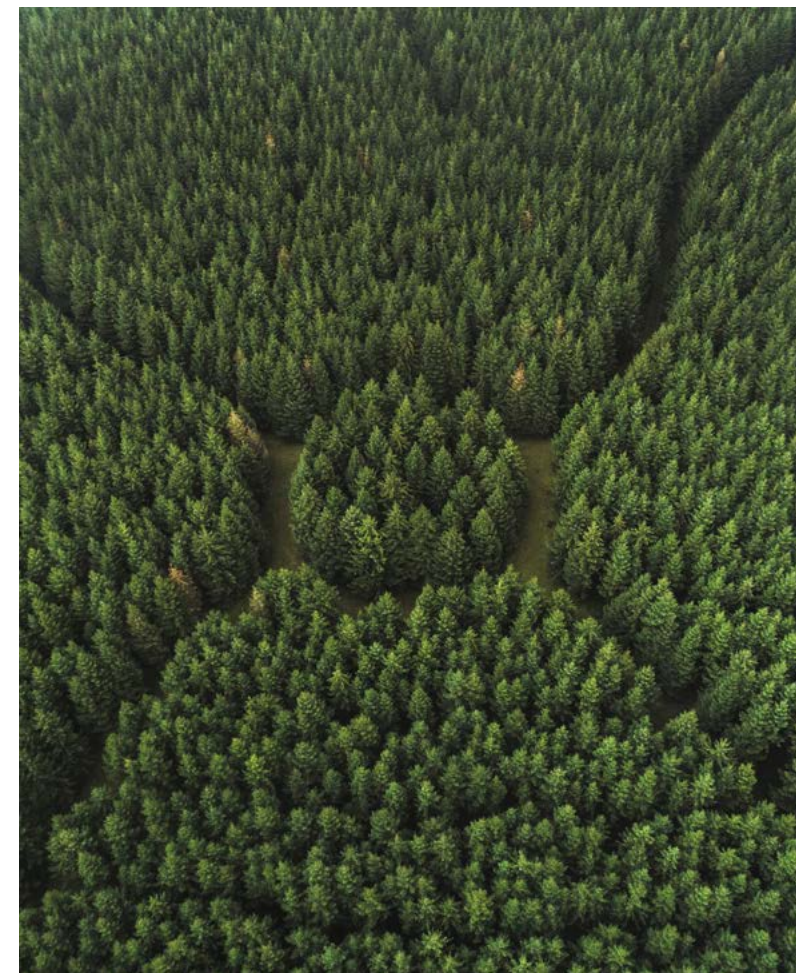
Fostering appropriate risk management within global stablecoin arrangements, and sound legal underpinning, as a basis for the use of stablecoins in multiple jurisdictions.

**19. Factor an international dimension into CBDC designs**

Providing domestic CBDC implementations with the necessary guidance to enable cross-border transactions via access by non-residents and/or interlinking with international infrastructure.

The Financial Stability Board (FSB) has also set out specific targets around key challenges in cross-border payments:

<b>Targets for addressing the four challenges of cross-border payments</b>			
<b>Challenges</b>	<b>Wholesale</b>	<b>Retail</b>	<b>Remittances</b>
<b>Cost</b>	No target set.	Global average cost of payment to be no more than 1% with no corridors with costs higher than 3% by end 2027.	Reaffirm UN SDG: Global average cost of sending US\$200 remittance to be no more than 3% by 2030, with no corridors with costs higher than 5%.
<b>Speed</b>	Large majority (e.g., 75%) of cross-border wholesale payments to be within one hour of payment initiation by end 2027.	Large majority (e.g., 75%) of payments to provide availability of funds for the recipient within one hour from the time the payment is initiated by end 2027.	Large majority (e.g., 75%) of remittance payments in every corridor to provide availability of funds for the recipient within one hour of payment initiation by end 2027.
<b>Access</b>	All financial institutions in all payment corridors to have at least one option and, where appropriate, multiple options for sending cross-border wholesale payments by end 2027.	All end-users to have at least one option for sending or receiving cross-border electronic payments by end 2027.	More than 90% of individuals who wish to send or receive a remittance payment to have access to a means of cross-border electronic remittance payment by end 2027.
<b>Transparency</b>	All payments service providers (PSP) to provide at a minimum a defined list of information concerning cross-border payments to payers and payees (including, e.g., total transaction cost showing FX rate and currency conversion charges, time to deliver funds, funds tracking, and terms of service) by end 2027.		



There is also a lot of activity at national levels on boosting global payments:

<p><b>UK</b></p>	<p>Bank of England has actively supported the G20 initiative for enhancing cross-border payments from the start. The bank is also committed to implementing the actions set out in the Stage 3 roadmap and are actively engaged in the international workstream to deliver the roadmap:</p> <p>Key major initiatives for the program:</p> <ul style="list-style-type: none"> <li>▶ Moved to ISO 20022 messaging on a like-for-like basis from June 2022, followed by enhanced ISO 20022 in February 2023.</li> <li>▶ Migration to the new core settlement platform by late 2023. The renewed Real-time Gross Settlement (RTGS) service will also enable wider access to central bank money with a more efficient and streamlined onboarding process for new participants.</li> <li>▶ The Bank announced its framework for broadening access to RTGS accounts for non-bank payment service providers in 2017, and there are now close to half a dozen non-banks that hold settlement accounts in RTGS.</li> </ul>	<ul style="list-style-type: none"> <li>▶ A new policy was announced to enable payment systems to open omnibus accounts in RTGS.</li> <li>▶ The bank is also exploring the potential to introduce an interface for synchronized settlement in renewed RTGS.</li> </ul> <p>The UK is in the middle of in change to its core payment systems:</p> <ul style="list-style-type: none"> <li>▶ The domestic retail interbank payments network is also being transformed into the New Payments Architecture (NPA). This is intended to deliver enhancements to payment services, innovation and increased choice.</li> <li>▶ This sits alongside infrastructure changes undertaken by the Bank of England to its high value gross settlement system and the developments in cross-border payments.</li> </ul>
<p><b>US</b></p>	<p>In accordance with G20 roadmap for cross-border payments, the Federal Reserve has taken few steps:</p> <ul style="list-style-type: none"> <li>▶ The Federal Reserve is working to improve the current system through the introduction of instant or fast payments via the FedNow Service by late 2023.</li> <li>▶ Experiments with CBDCs are being conducted at the Board of Governors, as well as complementary efforts by the Federal Reserve Bank of Boston in collaboration with researchers at Massachusetts Institute of Technology (MIT).</li> </ul>	<ul style="list-style-type: none"> <li>▶ The New York Federal Reserve launched a new innovation center to support the central bank as it explores the possibility of a digital currency. The centre, in partnership with the BIS Innovation Hub, will help the central bank improve the current payments system.</li> <li>▶ The Federal Reserve in conjunction with 10 US banks are also taking part in a US pilot on the RLN.</li> </ul>

<p><b>Singapore</b></p>	<p>The Monetary Authority of Singapore (MAS) has recently taken several initiatives to facilitate cross-border payments in accordance with different countries:</p> <ul style="list-style-type: none"> <li>▶ The BIS Innovation Hub Singapore Centre and MAS proposed a blueprint for enhancing global payments network connectivity via multilateral linkages of countries’ national retail payment systems. Project Nexus allows countries to link real-time national payment systems with minimal adaptations.</li> <li>▶ The MAS and the Reserve Bank of India planned to link Singapore’s PayNow and India’s Unified Payments Interface (UPI) real-time payment systems by July 2022.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Bank Indonesia and the MAS begun working on a cross-border QR payment method between Indonesia and Singapore in August 2022, as a part of the ASEAN-wide payments connectivity effort.</li> <li>▶ The MAS and the Bangko Sentral ng Pilipinas (BSP) have signed an enhanced FinTech Cooperation Agreement to facilitate interoperable payments between Singapore and the Philippines.</li> </ul>
<p><b>Europe</b></p>	<p>The European Central Bank (ECB) has two main initiatives on DLT:</p> <ul style="list-style-type: none"> <li>▶ EU-wide network of central banks to elaborate on DLT (and other latest technologies).</li> <li>▶ STELLA – joint research project of the European Central Bank and the Bank of Japan already started in 2016.</li> </ul>	<ul style="list-style-type: none"> <li>▶ The ECB has a clear view on CBDCs: They are “immediate, cheap, universal in terms of reach, and settled in a secure settlement medium,” – CBDC are considered as the “ultimate cross-border payment medium.” In addition, “... the interlinking of domestic payment systems and the future interoperability of CBDCs are the most promising avenues.<sup>1</sup></li> <li>▶ The ECB goes also beyond payments and analyses DLT for securities post trading.</li> </ul>
<p><b>Australia/ Hong Kong</b></p>	<p>Australia’s commitment to enhance cross-border payments has led to several initiatives:</p> <ul style="list-style-type: none"> <li>▶ Working alongside the BIS innovation hub in Singapore, the four central banks from Singapore, Australia, Malaysia, and South Africa planned to build prototypes in 2021 of shared platforms using multiple CBDCs, with the aim to enable financial institutions to transact directly with each other in digital currencies issued by the respective central banks.</li> <li>▶ Australia has launched New Payments Platform (NPP) which enhances international payments business service. This service will result in safer and faster cross-border payments and significantly increase the end-to-end speed of payments coming into Australia.</li> </ul>	<ul style="list-style-type: none"> <li>▶ The Reserve Bank of Australia has launched a research project exploring use cases for a CBDC in Australia, which received significant interest and submissions from industry.</li> <li>▶ Heritage Bank partnered with Convera to allow its international customers to easily send and receive money from overseas.</li> </ul> <p>Hong Kong has one of the most advanced experiments for CBDCs in cross-border payments:</p> <ul style="list-style-type: none"> <li>▶ Hong Kong is expanding this project from just bilateral cross-border tests to tests involving multiple jurisdictions. Jurisdictions that have recently joined are Mainland China and the United Arab Emirates.</li> <li>▶ Hong Kong serves as a fitting test-bed for international payments using the e-CNY, Mainland China’s CBDC, given its political and economic nuances.</li> </ul>

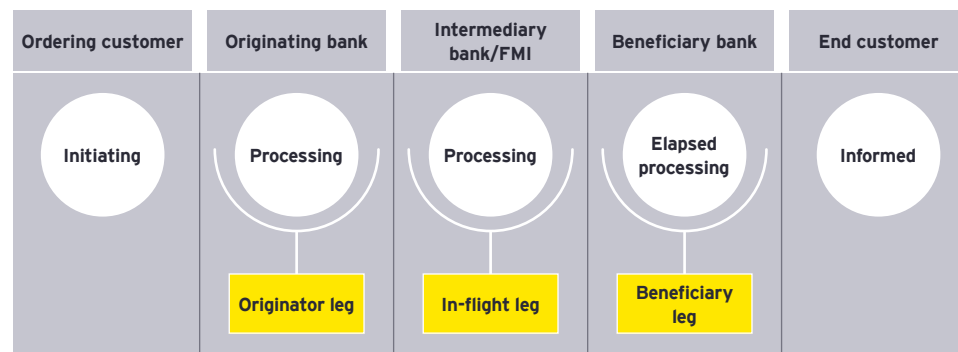
1 Towards the holy grail of cross-border payments (europa.eu), August 2022. [Find it here](#)

Swift has also worked on enhancing cross-border payments by developing Swift gpi. As per fig 9, the timeline of a payment on Swift gpi is split into three different legs:

- ▶ Originator leg: the ordering customer initiates the transaction, which is processed by the originating bank.
- ▶ In-flight leg: the intermediary bank or FMI processes the transaction.
- ▶ Beneficiary leg: the beneficiary bank finally processes the transaction and informs the end customer.

Fig 9 **How Swift gpi works**

The timeline of a payment on Swift gpi is split into three different legs:





# B

## Digital assets comparison analysis



Digital assets are increasingly leveraged to perform cross-border payments as they can address most of the key pain points. Significant benefits of digital currencies and DLT include them being:

- ▶ Immediate
- ▶ Cheap
- ▶ Within universal reach
- ▶ Settled in a secure settlement medium

#### **Central bank money (CBDC)**

- ▶ CBDC is a digital representation of fiat money issued by a central bank. It uses private money but is guarded by reserve assets of the country.
- ▶ CBDCs may either be wholesale or retail.
- ▶ A country's central bank shall regulate the monetary value of CBDC.

#### **Commercial bank money**

- ▶ Commercial bank money – people's bank deposits – is created through the intermediation of credit.

#### **E-money**

- ▶ Electronic money (e-money) is an electronic store of monetary value that may be used for making payments.
- ▶ E-money is not transparent and is only linked to fiat.
- ▶ E-money is centralized whereas cryptocurrencies are decentralized.

#### **Stablecoins**

- ▶ Stablecoins are crypto assets that look to reduce volatility by pegging their value to government-sponsored or fiat currencies.
- ▶ They are currently primarily used for facilitating trades between multiple cryptocurrencies.
- ▶ Stablecoins can be both centralized and decentralized.

#### **Cryptocurrencies**

- ▶ Cryptoassets (Crypto) are defined as private digital assets that depend primarily on cryptography and DLT.
- ▶ They are mostly volatile and unregulated.
- ▶ Crypto are decentralized and with limited supply.
- ▶ They have pseudonymous nature (privacy).

Currently, none of the digital currencies are able to meet all 12 dimensions of customer desirability. Stablecoins and crypto currencies in particular are not really applicable for corporate cross-border payments.

	Dimensions	CBCDs	Commercial bank money	E-money	Stablecoins	Crypto
1	Trust	✓	✓	✓	x	x
2	Public/private network	? <sup>1</sup>	✓	✓	? <sup>1</sup>	✓
3	Transactions reversibility	x	✓	✓	x	x
4	Asset type	✓	✓	✓	x	x
5	Regulatory compliance	✓	✓	✓	?	?
6	Transparency	✓	x	x	✓	✓
7	Interoperability	✓	x	x	✓	?
8	Usability	✓	✓	✓	?	✓
9	Authority	✓	✓	✓	? <sup>3</sup>	x
10	Interest bearing	?	✓	✓	✓	✓
11	Timeframe	✓	✓	✓	✓	✓
12	Cost <sup>2</sup>	✓	✓	✓	✓	✓

■ Yes   
 ■ No   
 ■ To be defined

1 Stablecoins and CBCDs can also run on private networks.  
 2 Gas fees are primarily paid on public networks.  
 3 Stablecoins can be both centralized and decentralized.

Source: EY analysis, August 2022.



# C

## Solutions comparison analysis

Although there are many other initiatives, projects and solutions in this space, our analysis focused only on the RLN and seven other closely comparable initiatives. The below list of initiatives is only meant to provide insights on the activity in the space and is by no means final nor comprehensive.

### **RLN**

- ▶ Real-time multi-assets settlement platform that enables mint, burn and transfer of regulated liabilities over DLT
- ▶ Supported by a community of industry participants

### **Finality**

- ▶ Blockchain solution to enable wholesale payments of tokenized cash assets
- ▶ Developed by a consortium of financial institutions

### **Project Dunbar**

- ▶ Shared platform for international settlements using digital currencies issued by multiple central banks
- ▶ Lead by the BIS, in collaboration with a number of central banks

### **mBridge**

- ▶ Multi-CBDC platform for international payments
- ▶ Supported by 22 public sector participants from HK SAR, Mainland China, Thailand and UAE

### **CLSNet**

- ▶ Blockchain-based multi-cash payment netting service
- ▶ Developed in collaboration with IBM

### **Partior**

- ▶ Open industry platform that enables multi-currency clearing and settlement over blockchain
- ▶ Developed by JP Morgan, DBS Bank and Temasek

### **Project Jura**

- ▶ Wholesale CBDCs transfer between French and Swiss commercial banks on a single DLT platform
- ▶ Collaboration between Banque de France, BIS, Swiss National Bank and a private sector consortium

### **Project Helvetia**

- ▶ Central bank money settlement with more tokenized financial assets over DLT
- ▶ Multi-phase collaboration between BIS, Swiss National Bank (SNB) and SIX



# Key contacts

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## Authors

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**Alla Gancz**

*Partner*

UK Payments Lead,  
Ernst & Young LLP

[alla.gancz@uk.ey.com](mailto:alla.gancz@uk.ey.com)

**Pierre Pourquery**

*Partner*

UK Head of Capital Markets,  
Ernst & Young LLP

[ppourquery@uk.ey.com](mailto:ppourquery@uk.ey.com)

**Margherita Baroni**

*Manager*

Capital Markets Technology,  
Ernst & Young LLP

[margherita.baroni@uk.ey.com](mailto:margherita.baroni@uk.ey.com)

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## Contributors

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**Anthony Culligan**

*Chief Executive Officer*  
SETL UK

[anthony.culligan@setl.io](mailto:anthony.culligan@setl.io)

**Marjan Delatinne**

*Head of Payments*  
SETL UK

[marjan.delatinne@setl.io](mailto:marjan.delatinne@setl.io)

**Jan Rosam**

*Partner*

Digital & Emerging Tech,  
Ernst & Young GmbH

[jan.rosam@de.ey.com](mailto:jan.rosam@de.ey.com)

---

**Mark Selvarajan**

*Partner*

FO Risk and Control Lead,  
Ernst & Young LLP

[mselvarajan@uk.ey.com](mailto:mSelvarajan@uk.ey.com)

**Muneeb Shah**

*Director*

Blockchain,  
Ernst & Young LLP

[muneeb.shah@uk.ey.com](mailto:muneeb.shah@uk.ey.com)

**Stefan Wannmacher**

*Senior Manager*

Digital & Emerging Tech,  
Ernst & Young GmbH

[stefan.wannmacher@de.ey.com](mailto:stefan.wannmacher@de.ey.com)

---

**Oliver Carew**

*Senior Manager*

FinTech Strategy Consulting,  
Ernst & Young LLP

[oliver.carew@uk.ey.com](mailto:oliver.carew@uk.ey.com)

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