FNALITY GLOBAL PAYMENTS

FNALITY PAYMENT SYSTEMS: FULFILLING REGULATORY REQUIREMENTS WITH DISTRIBUTED LEDGER TECHNOLOGY

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SECTION 1: INTRODUCTION

The advent of blockchain and distributed ledger technology ('DLT') has led to a marked surge of interest in the future of money and payments. One of the most vexing issues in the debate around cryptocurrencies, crypto - assets, 'stablecoins', central bank digital currency ('CBDC'), and wholesale payment systems – such as Fnality Payment Systems ('FnPSs') – is the slipperiness of the various concepts. As a result, the debate around the future of money and payments has often been fraught.

A common assumption in this debate is that the use of DLT in the transfer of monetary assets poses fundamentally new challenges for regulators and policy makers. Our view is that the technology underpinning the settlement of financial obligations ('payments') ought not be the primary focus of overseers, regulators and standard setting bodies. Far more important is the quality of the asset used to settle payments (the 'settlement asset') in terms of credit and liquidity risk, as well as the rules governing the settlement process. This view is supported by the Financial Stability Board (FSB), an international body that monitors and makes recommendations on the global financial system, which stated in a recent report that the "*same business, same risk, same rules*" approach should be applied to the use of DLT in post-trade markets. The FSB also stressed that '*regulatory, supervisory and oversight approaches should be agnostic of underlying technology*".[1] We illustrate here that well-designed DLT based payment systems like Fnality Payments Systems (FnPSs) are able to comply with existing regulatory frameworks that were originally developed for infrastructures that relied on centralised, non peer-to-peer settlement functions.

This note is structured as follows. In order to demonstrate why the quality of the settlement asset is highly important for the safety of a payment system, we first review the traditional forms of money, broadly categorised into central bank issued money and commercial bank issued money. We then consider the essential elements of DLT and show that the functions and processes behind payments are not substantially altered by DLT. In fact, well-designed DLT-based payment systems perform the same functions as existing financial market infrastructures (FMIs) faster and with greater resilience and could therefore contribute to a significant reduction in systemic risk. Finally, we illustrated how the Fnality Payment Systems fit into the FMI landscape.

SECTION 2: THE THREE FUNCTIONS OF MONEY

For over a century, economists have defined money as any good that is widely accepted as final payment by market participants. Throughout history, money has taken different forms. Examples include cowry shells, large stone wheels, strings of beads, minted coins and banknotes.

What do these forms of money have in common? They share the three functions of money:

1. Unit of account
2. Medium of exchange
3. Store of value

Sovereign states (or groups of sovereign states) codify by law the unit of account of their balance sheets, for instance, the US dollar for the United States or pound sterling for the United Kingdom. This also implies that their revenues (taxes) and expenditures (wages) are denominated in units of the sovereign currency.

Moreover, sovereign states establish central banks. The central banks have the primary mandate to conduct the monetary policy for their country or currency area. To this aim, they issue two forms of money: paper based banknotes for the public, and digital deposits ('reserves') for domestic banks and some Financial Market Infrastructures (FMIs).

Banknotes and reserves are claims on the central bank (the issuer) and are called 'central bank money'. Since a central bank cannot be insolvent (even if it has negative equity), claims on a central bank carry no credit risk. This characteristic makes reserves the preferred settlement asset in large value payments systems, i.e., payment systems that transfer significant sums of money and that accordingly are most likely to be systemically important.

In terms of value, however, most money in circulation is issued not by central banks but by private sector entities, in particular commercial banks or deposit taking institutions.

Deposits at a commercial bank are also denominated in the national currency. Due to legal provisions, banks are licensed to issue money (denominated in units of the national currency) in the form of deposits of households and businesses (“fractional reserve banking”). If financial obligations are settled on the books of a commercial bank (i.e. through a transfer of deposits from one client to another), they settle in an asset that carries a higher credit risk than banknotes or reserves at the central bank. Deposits at a commercial bank ('commercial bank money') can be considered equivalent to central bank money if the assets of the commercial bank are limited to central bank reserves and all of its liabilities are denominated in the same currency as its assets. Such a setup is sometimes referred to 'narrow banking'. In payment systems it is used, for instance, by CLS Bank or SECB (Swiss Euro Clearing Banking).

The one-to-one convertibility of commercial bank deposits into central bank money is neither given by nature nor is it guaranteed under all circumstances. Supervisory requirements (mostly the requirements of the 'Basel Framework' issued by the Basel Committee on Banking Supervision) as well as deposit insurance schemes are aimed at maintaining this convertibility at par to the greatest extent possible even in times of stress.[2] Under the Basel Framework, commercial banks must hold assets that exceed their deposits (liabilities) by certain factors ('capital requirements'). In addition, sufficient high quality liquid assets (HQLA) must be held at all times to meet potential short-term outflows of deposits, i.e. when depositors withdraw their money ('liquidity requirements'). Maintaining the convertibility of commercial bank money into central bank money at all times is, therefore, a paramount public policy objective as it protects the assets of households and businesses and fosters financial stability.

SECTION 3: SETTLEMENT OF FINANCIAL OBLIGATIONS

The objective of payment systems regulation is very similar to that of banking regulation. At the core of a payment or settlement process is the transfer of a settlement asset from the payor to the payee. The focus of payment system regulation is to ensure that settlement takes place in a safe manner, and that the settlement asset used is extremely low in credit risk and liquidity risk and can be redeemed immediately at par at all times. Accordingly, many private sector payment systems, such as CHIPS, Faster Payments, EURO1, and CLS, create and use a settlement asset that is of even higher quality than money issued by a typical commercial bank. They achieve this by guaranteeing that the settlement asset used by the payment system always corresponds 1-to-1 with the funds held at the relevant central bank.

There is much variation across jurisdictions as to how payment systems are regulated, in particular for retail or low-value payment systems. But in the area of wholesale payment systems (i.e. systems for large value inter-bank payments) the CPMI-IOSCO's 2012 *Principles for Financial Market Infrastructures* (PFMI)[3] provides an internationally accepted standard.

Like the Basel Framework for bank regulation, the PFMI are implemented globally through domestic rules and legislation. Transactions that are settled in wholesale payment systems are, invariably, denominated in sovereign currencies. Principle 9 of the PFMI ('Money Settlements') requires settlements to be conducted "*in central bank money, where practical and available*". If the central bank is the operator of the payment system, the settlement asset is a direct liability of the central bank (i.e. reserves). If central bank money is not used, a payment system "*should minimise and control the credit risks*" arising from the settlement asset. In its report on wholesale digital tokens, the CPMI noted that "*a safe settlement asset retains its value to the holder and is therefore acceptable to others as a means of payment*".[4]

New DLT based private-sector payment systems that are intended for settling large value payments obviously fall within this existing framework. According to the CPMI, "*a wholesale digital token arrangement needs to be compliant with all applicable regulatory and oversight requirements. If a wholesale digital token arrangement is a systemically important FMI it will be expected to observe the PFMI in the same way as other FMIs*". (CPMI (2019)). This approach reflects the view noted above (as endorsed by the FSB in 2020)[5] that the regulatory approach to systemically important payment systems should be agnostic of the underlying technology. Arguments to the contrary are often based on misunderstandings as to the fundamental nature of DLT and its proposed use in FMIs.

SECTION 4: DLT IN POST-TRADE SETTLEMENT

Discussions on DLT and payments often assume that the underlying blockchain technology is what distinguishes the monetary nature of a DLT-based settlement asset from that of other types of money. To some extent this may be explained by the advent of Bitcoin, which for the first time allowed for the creation of a digital currency without an identifiable issuer. However, Bitcoin remains an exception, as basically all other forms of DLT based money are issued by established legal entities which are the natural addressees of regulators and overseers.

A 'blockchain' is merely a type of database with some specially tuned properties. The underlying technology stack makes use of common computer engineering techniques such as public/private key cryptography, hashing and Merkle trees, none of which are unique to DLT. These elements are calibrated in a certain way to achieve certain target properties, such as decentralisation, immutability, and various types of distributed 'consensus'. All of these elements could be used in other types of database; likewise, the target properties of decentralisation, immutability (etc.) could in theory be achieved by technical means other than blockchain. An arrangement based on fax machines and spreadsheets could re-create many (if not all) of the properties that make Bitcoin a peer-to-peer payment solution. If this is true, then the monetary nature (if any) of Bitcoin derives not from the computer code of the blockchain, but from the specific properties that the blockchain protocol is designed to achieve.

The operational qualities of blockchain (such as resilience and immutability) make the technology uniquely suited to be the IT infrastructure for a new generation of financial market infrastructures. But a crucial distinction should be made between DLT-based payment systems, on the one hand, and, on the other hand, cryptocurrencies that are designed to be used as payment instruments. The distinction between the two lies in how technology is used, not what technology is used.

All blockchains work by adding digital data to a distributed ledger. In a general sense, these data are referred to as 'tokens' on account of how they are manipulated technically. In cryptocurrencies, there is typically a finite supply of these tokens and in the case of Bitcoin and similar tokens, market participants attribute a monetary value to the scarcity of the tokens and to a token-holder's ability to transfer it to a third party, without the intervention of an intermediary. To the extent that the token has monetary value, that value exists only on the blockchain.

What are often referred to as 'stablecoins' extend the cryptocurrency model by linking the value of a token to an underlying monetary or non-monetary asset (which the FSB refers to as the 'underlying reserve asset').[6] Most stablecoins are intended to be widely available as a means of payment, exchangeable on the market, and convertible to the underlying asset; and in this way, stablecoins may loosely resemble a bank deposit, e-money or similar financial instrument/products. The tokens typically embody contractual rights, exercisable against the stablecoin issuer, that promise on-demand redemption or conversion of the token into an equivalent unit of the underlying asset. The quality of a stablecoin ultimately depends on the nature and enforceability of the contractual right to redemption, whether or not the issuer has imposed restrictions on redemption (and the consequent risk of runs on the underlying asset), and the quality of the underlying asset itself (i.e. the mitigation of credit risks through custody arrangements). But even where the underlying asset takes the form of traditional asset classes, the right of redemption typically attaches only to the token that resides and trades on the blockchain. As with cryptocurrencies, it may therefore be said that stablecoin tokens on a blockchain embody monetary value.

Fnality Payment Systems (FnPS) use neither a cryptocurrency nor a stablecoin. As we will discuss further in the next section, in FnPSs the token is not the medium of exchange; it is merely a component of the exchange mechanism. The settlement asset is the medium of exchange, and the purpose of the blockchain underpinning each FnPS is merely to record the transfer of an amount of this settlement asset from one participant to another. This settlement asset derives its value from, and exists only within the legal framework of the rules and governing arrangements of each FnPS. And whereas this settlement asset is similar to that of many existing payment systems, it shares few common features with cryptocurrencies and stablecoins. If the FnPS's blockchain were to be replaced by spreadsheets and fax machines, the legal nature and monetary characteristics of the settlement asset would remain precisely the same; the only difference would be the loss of the operational efficiencies and resilience made possible by the use of DLT.

It should be noted, then, that the use of DLT in a payment system does not automatically give rise to a crypto-asset. In keeping with a functional approach to regulation and the philosophy of "same business, same risk, same rules", the blockchain at the operational core of each FnPS should be 'regulated' not because of what it is, but on account of what it does. In this way, we anticipate an approach similar to that applied by supervisors and overseers to existing, systemically important payment systems. As noted above, in most jurisdictions, the basis for this oversight is the relevant national implementation of the PFMI.

SECTION 5: FNALITY PAYMENT SYSTEMS

This section shows how Fnality Payment Systems, the first DLT-based wholesale payment systems, can comply with the above-mentioned PFMI as required by their overseers.

Fnality International, backed by a group of leading global financial institutions, is developing a novel type of payment infrastructure for wholesale transactions (Fnality Global Payments, or 'FnGP').[7] FnGP consists of (initially) five interlinked wholesale payment systems for each of CAD, EUR, GBP, JPY and USD. Each FnPS processes and settles payments on gross basis in real-time, very much in the same way as existing central bank operated Real-Time Gross Settlement (RTGS) systems (e.g., Fedwire, Target2, CHAPS).

Participants in each FnPS will settle wholesale payments in a settlement asset referred to as 'Funds Balance'. Although there will inevitably be a degree of variation across jurisdictions, the common design objective of all FnPSs is that Funds Balance will be a legal claim, entitlement or interest (as the case may be) corresponding to a pro-rata amount of a deposit (denominated in the currency of the relevant jurisdiction or currency area) held in an account at the relevant central bank ('System Account'). The same (or a similar) mechanism is used in existing private sector payment systems, such as CHIPS in the United States and RT1 in the euro area. Depending on central bank access policies and the arrangements governing each FnPS, the System Account may be held by the Fnality Local entity, or a subset of eligible participants jointly (on behalf of all participants), as the case may be. For this reason, the legal claim, entitlement or interest held by a participant may (but will not necessarily) be against the relevant central bank.

In each case, Funds Balance will be a fungible settlement asset with a credit risk profile similar to that of central bank money. At any given time, the aggregate Funds Balances in each FnPS are underpinned by a corresponding amount of pooled fiat currency held in the System Account at the relevant central bank. Thus, immediate convertibility or redeemability from Funds Balance into central bank money ('Defunding') is guaranteed at par during the opening hours of the local RTGS system. Accordingly, FnPS participants should never have a reason to defund Funds Balances from a FnPS due to concerns regarding credit risk or liquidity risks.

Where FnPS is different, however, is the operational infrastructure (i.e. the ledger) it uses to settle payments among its participants and maintain the records of its participants' Funds Balances. The design goals for the FnPS's technical architecture are to distribute the core operational functions of a payment system across a network of participating entities. These core operational functions are:

1. the settlement of payment instructions and the processing of Defunding instructions submitted to the FnPS; and
2. maintaining the distributed ledger that records the execution of instructions.

Within FnPS, no single entity is solely charged with fulfilling either of these functions; indeed, the running of technology and operational arrangements in order to achieve these functions is intentionally designed to be fulfilled at all times by a sufficient number of legal entities with a common vested interest in the safe and efficient operation of the payment system. This ensures the resiliency of the FnPS and minimises the concentration of failure risks. In fact, the use DLT allows FnGP to achieve levels of resiliency that are unmatched by any conventional wholesale FMIs. We will explain the resilience benefits of FnGP in a forthcoming paper.

SECTION 6: CONCLUSIONS

Technological developments are happening at a very fast pace and are inherently unpredictable. More than ever the principle of technology neutrality remains one of the key principles of sound regulation. The risk-based approach taken in CPMI-IOSCO's PFMI is a paragon of technology neutral regulation.

Well-designed wholesale payment systems based on DLT are capable of fulfilling the regulatory requirements, set out in the PFMI and elsewhere, that have been developed for traditional systems with centralised record-keeping. The mere use of this new technology does not mean that there are gaps in existing law or regulation, nor does it necessarily create opportunities for regulatory arbitrage.

The essential features of a payment system, such as the choice of the settlement asset and the rules guiding the settlement process, are designed independently of the system's technological infrastructure. In keeping with the principle of technology neutrality, the technical nature of the IT infrastructure should not determine the regulatory characterisation of the payment system. The decision to build the FnPS on blockchain speaks to the technology's unprecedented operational reliability, resilience and tamper-resistance, and the fact that DLT-based payment systems have the potential to enhance financial stability. Moreover, by linking such systems, as envisaged by FnGP, cross-border payments as well as foreign exchange transactions can be settled in a much quicker fashion without giving rise to credit and liquidity risk exposures for market participants.

FOOTNOTES & REFERENCES

Footnotes

1 - FSB, '*Report and recommendations on regulatory, supervisory and oversight of challenges raised by "global stablecoin" arrangements: overview of public consultation*', October 2020

2 - The same argument is made by Fabio Panetta, Executive Board Member of the European Central Bank. See Fabio Panetta, '*The two sides of the (stable)coin*', November 2020

3 - CPMI-IOSCO, '*Principles for Financial Market Infrastructures*', April 2012

4 - CPMI, '*Wholesale digital tokens*', December 2019

5 - FSB, '*Regulation, Supervision and Oversight of "Global Stablecoin" Arrangements Final Report and High-Level Recommendations*', October 2020

6 - FSB, '*Addressing the regulatory, supervisory and oversight challenges raised by 'global stablecoin' arrangements*', April 2020

7 - For more information on Fnality Global Payments, please see '*Enhancing the safety and efficiency of cross-border interbank payments: an overview of Fnality Global Payments*', available here.

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