Decentralized Blockchained and Centralized Real-Time Payment Ledgers

- Development trends and
- Basic Requirements

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The number and diversity of virtual currencies have grown rapidly during the last years.

More than 500 probably close to 1 000 by now, e.g. Bitcoin, Ripple, Litecoin, Peercoin etc.

Decentralized ledger technology (DLT) has lately got much attention by major market participants.

However, which of these developments are hype and what will become lasting?

The basic innovative implementations in DLT

- A common transaction database containing all transactions in a given ledger (and therefore also all account balances are retrievable)
  - Based on limitless very low cost ICT storage capacity
- An verified audit trail of all accepted transactions
  - Based on PKI-encryption implementation and continuous reconciling
- A decentralized cooperation model among several service providers for updating the common database with new transactions

Providing and maintaining an overall, verified and continuously accessible transaction database is the basic novelty.

Basic elements of any e-payment system

- An accounting methodology and accounting setup
  - Individual accounts creating a specific ledger of accounts
- A settlement asset or media
  - The wealth booked on the ledger accounts and used for transfers
- An infrastructure for transaction processing
  - The entities participating in the transaction processing
- Methods, standards and regulations for the infrastructure
  - Technical and general requirements for accounts and processes

All payments are basically just transfer funds from senders' accounts to receivers' accounts!

Important distinctions

- DLT (Decentralized ledger technology) is just an accounting method
- The value of the employed assets (gold, securities, bonds, currencies) recorded on accounts of a ledger are independent of the accounting method
- The choice of accounting methods can only affect the costs of account keeping and account transfers

Compare with developments from paper-based securities to book-entry securities!

How large will the true reduction in real accounting costs become due to change of accounting method to DLT? Which are the general consequences of this cost reduction?

Note! Several differences in virtual currency setups, which are independent of accounting method

- Roles of custodians maintaining individual accounts
- Roles of issuers issuing assets into the ledgers
- Roles of reconcilers/central depositories reconciling the ledgers processing
- Roles of exchanges/cross-ledger infrastructures for inter-ledger transfers

Virtual currencies contain several differences in the service setup/structure, which are mostly based on regulatory differences compared to traditional payments

Decentralized customer accounts in common ledgers

- Decentralized accounts are already used in securities systems, where CSDs (Central Securities Depositories) maintain the overall ledgers and custodians maintain customer accounts
- In bitcoin-type of virtual currencies the overall ledger is maintained by ”miners” and individual accounts by the customers themselves (or bitcoin custodians e.g. Easywallet)

Main issue: Will customers be interested in maintaining their own accounts or in using trusted service providers (custodians)?

- It is a know-how and security issue
- Customers use already e-service providers for their emails, pictures, calendars etc.
- It will not be a cost-issue as e-payments are highly automated

Whom will customers have trust in regarding safe-guarding their payment funds and other assets, themselves or specialists?

Issuers and issued assets

- For real commodity assets, the issuers or depositories guarantees that account balances (or certificates) correspond with reality
- For equity type of securities issuers provide dividends etc.
- For bonds and deposits issuers provide interest on and repayment of capital

What kind of assets are virtual currencies?

- Conclusion: Non-interest bearing perpetual bearer bonds without any specific identifiable issuer

Compare with perpetual government bonds without interest or travelers' cheques without issuers honouring them

A bearer bond without interest and repayment would be highly difficult to place on a traditional market!

Fiat currencies vs real assets

- The value of fiat currencies depends interest rate developments, monetary policies, general demand for the currency etc, which results in inflation or deflation of the currency value
- The value of real assets depends on the market demand for the underlying asset
- There exist book-entry systems based on DLT already for example for gold accounts
- A diverse basket of real assets would provide for a very stable "monetary" value without inflation/deflation developments (although prices of individual assets and service will change)
- Transfers on accounts of book-entry securities carry the same costs as bookings of any account transfers

Moving to real-asset based payments would transfer seignorage benefits from service providers to payment users, but require increased exchange services

Reconcilers

- In virtual currencies “miners” reconcile the database and verify transactions, compared to regulated banks and CSDs in traditional payment and settlement systems
- In bitcoin-type of system structures, the miners compete for solving the reconciling task
- In traditional systems, trusted regulated service providers provide the reconciling services

Reconciling is a centralized service,
which can be shared among several service providers.

However, competing for reconciling tasks, as in bitcoin-type of systems, will increase costs, as all but one service provider will devote resources without benefits.
Delegating reconciling to a limited number of supervised entities will decrease costs.

Cross-ledger infrastructures, 3- or 4-party setup

- In a 3-party setup users can only make “native” transfers to each other within the same ledger e.g. within PayPal, Bitcoin, Ripple ledgers
- In 4-party setups users can make “native” transfers across ledgers by using inter-ledger settlement systems e.g. in traditional credit transfers among banks, e-mailing, SMS-messages
- 3-party setups require users to keep accounts within the same ledger, while in 4 party setups users can keep accounts with competing ledgers
- Several popular services like Linked-in, Facebook, Instagram, WhatsApp and their competitors are 3-party systems and participants can only reach other participants within the system, that is, users need to participate in several systems in order to reach all other users
- In 4-party systems, users can reach competing service providers’ customers via the standardized interlinkage infrastructure

A 4-party setup provides more competition, but will require interlinking standards, which can slow down developments

Exchanges

- Exchanges are needed when transactions are made between ledgers operating in different types of assets and currencies
- Exchanges will establish the current exchange rate in real-time
- The costs of automated exchanges services decrease, which supports increased use of cross-asset and -currency transactions and increased market liquidity
- With increased market liquidity customers could move to a wider spectra of liquid assets suitable for payments e.g. mutual funds and book-entry commodity baskets

Network services are generally concentrated to a limited number of competing services due to network externalities. It is therefore difficult to foresee a continuous market for several hundred different virtual currencies providing similar services.

Costs and hidden vs transparent pricing

- Transfers need to be booked on secure accounts and reconciled within the overall ledger
- In the cloud-computing world of today, the costs for account updates and reconciling will basically be the same for DLT and traditional efficient centralized services
- Due to competition supporting regulations, traditional payments have moved to transparent pricing, while virtual currencies are mainly based on hidden non-transparent pricing
- Virtual currencies like bitcoin charge their processing costs via the issuer benefits and mostly hidden reconciling charges of miners
- According to several studies both real processing costs and charges in virtual currencies are in fact higher than in traditional payments, but this reality is hidden from users through non-transparent pricing

The interest in virtual currencies
is mainly based on distorting price/cost signals

Payer anonymity

- Customers in virtual currencies can currently use pseudonyms as their identifiers i.e. KYC (know-your-customers) –requirements are often bypassed.
- However, the senders and receivers of payments know generally their counterparties and their pseudonyms
- Open transaction databases provide the possibility to retrieve all transactions on a given account and its current balance
- Users can change their pseudonyms and use parallel pseudonyms

Will average customers be interested in such openness?

Will average customers benefit from such anonymity, which supports criminal activities?

Is there a general need for increased e-payment anonymity, but with improved criminality barriers?

Compare with the reasons for license plates on cars!

Regulatory requirements

- Regulatory requirements on payments have been defined mainly for the protection of average consumers, investors and tax payers
- Issuers of "virtual" assets should be identified and they should provide accurate description of issued assets and associated risks
- "Virtual" central depository services should fulfill CSD licenses and requirements
- "Virtual" exchanges should fulfill exchange licenses and requirements
- Providers of custodian / asset safe-keeping services for "virtual" should have proper license and fulfill associated requirements
- Deposit-taking of "virtual" currencies for re-investing should require a deposit-taking license

Similar risks in virtual as in traditional schemes!

Possible regulatory arbitrage between virtual and traditional currencies will be on the costs of average consumers, investors and tax payers.

Development trends and future payment systems

- Moving to real-time credit transfers using both decentralized and centralized ledgers
  - System structure determines as there is no major cost difference
- Moving to global standards (probably ISO 20022) and global reach/connectivity
  - Compare with developments in e-mailing and mobile phone systems
- Increased security via encryption and e-identity solutions
- Consumer and investor protection will, also in future, require regulation and supervision
- Increased cost transparency would speed up change-over to efficient solutions
- Decreasing exchange costs will pave the route for moving to real asset / commodity-based payment assets

DLT is just an accounting method, which will hardly revolutionize payment habits,
most customers will still use account service providers and traditional currencies.

However, the slow pace of banks
in adapting modern efficient technology and
in reducing their costs/price margins,
may transfer customers to other payment service providers.

Customers want to have
common global, secure and easy-to-use
real-time credit transfers!
Who will provide the service?

Hype is based on distorted price signals and unrealistic expectations.

Payment developments have generally been slow, due to several elements causing reduced development interests of inter-bank services.

However, the economic realities will determine the long-term developments also in the payment industry.