Asset-backed Currencies
in Retrospective and Perspective
Past, Present, Future

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“I. The outbreak of the crisis and its spillover to the entire world reflect the inherent vulnerabilities and systemic risks in the existing international monetary system.”

“II. The desirable goal of reforming the international monetary system, therefore, is to create an international reserve currency that is disconnected from individual nations and is able to remain stable in the long run, thus removing the inherent deficiencies caused by using credit-based national currencies.”

“III. The reform should be guided by a grand vision and begin with specific deliverables. It should be a gradual process that yields win-win results for all.”

Dr. Zhou Xiaochuan, Governor of the People’s Bank of China, 23 March 2009
Today, for the first time ever, there is the possibility of a digital currency that combines the best features of both cash and digital currencies.

This currency is largely immune to policies of the central banks that control the world’s reserve currencies.

Such a currency has enormous potential to improve the stability and competitiveness of trading and natural resource producing economies.

We propose to develop a trade-oriented asset-backed digital currency, aimed at facilitating international trade and making it as seamless as possible.
This currency will be based on proprietary framework combining the most recent advances in blockchain and distributed ledger technology, cryptography, and secure multi-party calculations, together with time-tested methods for preventing double spending.

Unlike Bitcoin, it will be fast, scalable, and environmentally friendly.

It will also be transaction friendly because of its low volatility vs fiat currencies.
Digital Trade Coin (DTC) in a Nutshell

- Coins: Roman, Iranian; used in Silk Road
- Coins: Spanish, Austrian: used in Age of Sail
- Coins: Sterling: reserve currency driven by the British Empire
- Dollar: used as reserve currency for 20th Century
- Euro, Yen: added to reserve currency basket in late 20th Century
- ...and now the Yuan and a revived Silk Road
The Nabataean Kingdom

Nabataean Kingdom (400 BC – 100AD)

Figure: Nabataean Kingdom.
Trade Coins on the Silk Road:
silver *drachm* of Sasanian Iran and gold *solidus* of Byzantine empire

**Figure:** Old Silk Road.
CONCLUSION:
PROSPERITY COMES FROM CONNECTIONS

Figure: New Silk Road.
Pieces of Eight

Trade Coins: Spanish Piece of Eight, Austrian thaler,

Figure: Spanish Pieces of Eight
Recent Technology Advances

**Figure**: Recent distributed ledger technology and data science innovations
Every century there has been a major innovation that has closed existing gaps; Blockchain will play a key role in the Gap of the 21st century.

Figure: Important innovations. Source: Richie Etwaru.
Why Blockchain Can Potentially be Useful?

- Distributed ledgers come in several flavours:
  A Unpermissioned public ledger (Bitcoin, Ethereum, and the myriad others)
  B Permissioned public ledger (Ripple, etc.)
  C Permissioned private ledger (R3 CEV and other similar projects)
  D Traditional centralized ledger

- Mechanisms for controlling distributed ledgers:
  A proof of work (pow)
  B proof of stake (pos)
  C third party verification, etc.
How to Choose a Ledger?

- What ledger is needed?
- Is there need to joint writing access?
- Who are the writers (are they known, are their interests aligned, can they be trusted)?
- Are there trusted third parties (one or several)?
- Do you want (need) to make transactions public or private, etc.?
- Think carefully before deciding which ledger to use!
Sketch of Monetary Circuit

Figure: Sketch of monetary circuit. Source: Scientific American, vol 318, no 1.
Figure: Bitcoin setup. Source: Scientific American, vol 318, no 1.
Bitcoin Deficiencies

- Bitcoin has no value
- Accordingly, its price vs a fiat currency or a representative basket commodities excessively volatile
- As a result, it cannot be used as a transaction currency (think of a mortgage taken in bitcoin in 2014)
- No can it be a unit of account or a store of value (it goes up and down massively)
Figure: Ripple setup. Source: Ripple Labs.
Local Payments

Figure: Local payments current. Although existing payment system IS NOT broken (for instance, Gross Real Time Settlement works well), it is expensive. Source: SWIFT.
Global Payments, Current

**Figure:** Global payments current (after WEF). Although existing payment system IS NOT broken (for instance, Gross Real Time Settlement works well), it is expensive.
Figure: Global payments future (after WEF)
Central Bank Issued Digital Cash (CBDC)

- Potentially, central banks could issue digital cash
- CBDC opens way to a better monetary policy
- But also a possibility of pushing interest rates into a seriously negative territory and other controversial policies
- On the one hand, increasing tax collection, fighting crime, etc.
- On the other hand, excess control over ordinary citizens
- In principle, it would be possible to open a checking account at central bank directly, thus making retail banks obsolete
- In practice, it is more convenient to do by issuing licenses for narrow banks
Historical Approaches to Asset-backed Currencies

- The idea of anchoring value of paper currency in baskets of real assets is old
- Gold and silver as well as bi-metallic standards have been used for centuries
- Two approaches are common:
  - A redeemable currency backed by a basket of commodities;
  - B a tabular standard currency indexed to a basket of commodities.
Historical Approaches to Asset-backed Currencies

- Friedrich Hayek (1943) proposed to establishing a universal basket of commodities, which every country would use to back its currency.
- John Maynard Keynes (1941-1943) proposed the bancor, an international currency defined in terms of a weight of gold. The bancor is supposed to be a multilateral transaction currency.
- Nicholas Kaldor (1963) proposed a new commodity standard, which he also called bancor, a commodity reserve currency.
- Xiaochuan Zhou (2009) proposed a new international reserve currency anchored to a stable benchmark.
USC is helpful from a technical perspective, but it does not solve issues of monetary policy. We wish to address this issue by building a counterweight for fiat currencies by backing the DTC by a pool of real assets. We start with oil, but eventually expand to metals, crops, mooring rights, etc. Sponsors bring their oil to the pool administrator, who issues DTC in one-to-one ratio. DTCs are sold to the public. The corresponding fiat currencies are deposited with the affiliated narrow bank. The proceeds are passed through to sponsors.
As a result, the administrator is in possession of real assets, sponsors with fiat currency, general public with DTCs, which can always be converted into fiat at the current market price.

The price $P_{DTC}$ of DTC will be close to (but not exactly at) the market price of the corresponding asset pool, $P_M$.

Indeed, if $P_{DTC}$ falls significantly below $P_M$, economic agents will put DTC back to the administrator, who will have sell a fraction of the pool’s assets for cash and pass the proceeds to these agents.

If $P_{DTC}$ increases significantly above $P_M$, sponsors will supply more assets to the administrator, who will issue additional DTC and pass them to sponsors, who will sell them for cash, just pushing the price down.

This mechanism ensures that $|P_{DTC} - P_M| / P_M \ll 1$, a very desirable feature, especially compared for conventional cryptocurrencies, habitually exhibiting extreme volatility.

At the same time, outright manipulation by central banks is not possible either.
Figure: DTC setup. Source: Scientific American, vol 318, no 1.
Figure: Architecture.
**Figure:** Ecosystem.
Figure: Ledgers.
Figure: Conversion.
DTC Setup

Figure: Circulation
DTC Advantages

- DTC has real value
- Accordingly, its price vs a representative basket commodities has very low volatility
- The price of the DTC vs a fiat currency is more volatily but still much lower that the price of bitcoin.
- As a result, it can be used as a transaction currency (think of a mortgage taken in DTC in a country which is naturally aligned with some of the major constituent commodities)
- DTC can be used as a unit of account and a store of value (as much as gold or oil, say, can)
The idea of distributed ledgers is not new
Modern technology gives it a new lease of life
Potentially, distributed ledgers have numerous applications in finance
Cryptocurrencies are the best known but not the only ones
Digital cash is very promising avenue
If physical cash disappears, it is possible to imagine a future where everyone has direct access to central bank cash, albeit indirectly
Retail banks may bifurcate into narrow banks and investment pools
Asset-backed cryptocurrencies can serve as a much needed counterpoint for fiat currencies