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First Look: Libra

An in-depth review of Facebook's long-anticipated entry into cryptocurrency

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KEY TAKEAWAYS

- Libra is a cryptocurrency minted on the Libra Network, a blockchain developed by a Swiss foundation and a consortium led by **Facebook**.
- This cryptocurrency is backed by a basket of financial assets (*Libra Reserve*) provided by node operators. In its initial release scheduled for 2020, Libra will be backed by assets denominated in **four fiat currencies**: USD, EUR, JPY and GBP.
- Running on a **Proof-of-Stake (PoS) blockchain** with a 2-token system, this new financial infrastructure will rely on the BFT-consensus algorithm and will support smart-contracts after it completes its transition from a permissioned to a permissionless environment.
- Within the next 18 months, Libra will be incorporated into the Facebook ecosystem built around Messenger, WhatsApp, and Facebook.com (using the Calibra wallet interface). It is likely to foster rapid expansion of its **existing 2.4 billion user base** to adopt (and transact with) the Libra token across the globe.

- In the medium-long term, this initiative is expected to have a significant impact on both local and global markets, with **significant implications** on the **cryptoasset**, **financial,** and **economic** landscape.
- **In the medium term:**
    - Facebook has a chance to **further its place as a provider of open-source tools** for digital apps, sites, and e-commerce.
    - Libra may spark additional **cryptocurrency trading volume** due to **increased accessibility** from both institutional players and everyday retail users.
- **In the long term:**
    - **Reshaping of the payment industry:** A new set of gatekeepers may emerge in the digital world which would threaten the existing positioning of banks as *"payment facilitators"*.
    - **New offerings of financial services:** New service providers may emerge, building innovative decentralized applications on the Libra network which would ultimately provide new financial services for end-users across the globe.
    - **Advancing greater freedom of money and lowering capital restrictions worldwide:** Central banks may have a **harder time preventing "capital flight"** and maintaining monetary policies with strong capital restrictions.
    - **"Un-dollarization of the world":** Should Libra see massive global adoption, a **new unit of account for trade could emerge** and hence, reduce the reliance on a single currency for quoting global exchange goods and services.
- The Libra project has a chance at becoming the first "everyday" implementation of the ideology and theory behind the Special Drawing Rights (SDR) and other IMF / World Bank initiatives, manifested as a cryptocurrency targeting mass adoption by both institutions and individuals.

On June 18th 2019, Facebook released details about **Libra, a stable cryptocurrency backed by a basket of financial assets, which runs on its own blockchain.**

Throughout this report, we will look into details about this new, highly anticipated, cryptocurrency before diving into the technical details. Eventually, we will discuss what the impacts are from both a local and global perspective on different timescales.

1. An Overview of Libra

Initially announced by Facebook earlier this year, Project Libra was officially revealed on June 18th 2019.

> *Libra is a new global cryptocurrency, built on an open-source blockchain called the Libra Blockchain featuring its own proof-of-stake protocol.*

According to its whitepaper[1], Libra is backed by a not-for-profit organization called the **Libra Association,** which will serve two main functions:
- Governing and overseeing the Libra network.
- Managing the reserve that keeps the value of Libra backed by real-world assets.

Libra is backed by its reserve ("Libra Reserve") which comprises of a basket of **low-volatility** assets structured to keep its **value relatively stable**.

However, Libra is **not designed** to be a stablecoin (as currently defined in the cryptocurrency world) with its value **not pegged** to a single fiat currency. Specifically, Libra will instead initially be backed by a basket of assets denominated across **four fiat currencies**: USD, GBP, EUR and JPY. While these fiat currencies are the first to be included, these are three key criteria we expect for any asset - fiat or not - that could be eligible in the long-term for inclusion into the Libra Reserve:

- **Individually uncorrelated:** only fiat currencies with free-float can be eligible; currencies that are tied / soft-pegged to each other would only be redundant in the Libra Reserve.
- **Decision-making process** should be tied to either public organizations (i.e. central banks) or an asset being freely accessible (e.g. commodities).
- **Quotability:** assets must be universally recognized across jurisdictions, to have programmatically-quotable value. For instance, Apple shares (AAPL) are only traded with a single quote currency: USD. As a result, its shares lack additional quotes to serve as a way to value other assets in various jurisdictions. Alternative assets like Gold or Bitcoin could serve this purpose better as they are traded in multiple markets globally and thus be included in the basket of assets used to determine Libra's value for end users around the world.
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Beyond the high-level design and key parameters of the Libra ecosystem, we next explore the technical underpinnings of the Libra Network itself.

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[1] https://libra.org/en-US/white-paper/#introduction

2. Technical overview

In this section, the consensus algorithm, along with the chains' smart contract support and 2-token system will be discussed.

Consensus algorithm

Libra will run on its native blockchain, **Libra Blockchain**. The chain is supported by a **Proof of Stake (PoS) algorithm,** where nodes run by consortium participants are widely dispersed geographically with high technical requirements.

These nodes will rely on a new consensus algorithm that is [Byzantine-Fault-Tolerant](BFT). This consensus algorithm, named [LibraBFT], is a variant of the HotStuff framework[2] that was released in 2018 by [Maofan Yin] and [Dahlia Malkhi] of VMware Research. This framework may allow for **future interoperability with other chains powered by BFT consensus**, such as Tendermint-based chains like Binance Chain.

Quorum, the permissioned blockchain built by JP Morgan, was [previously discussed extensively] as the other large cryptoasset initiative from a traditional (non-crypto) company. The following table illustrates similarities and differences between **JPM Coin/Quorum and Libra/Libra Network.**

Table 1 - Comparing JPM's Quorum & Facebook's Libra

	JPM Coin	Libra
Blockchain	Quorum (Ethereum-fork) Private	Libra Network Public
Consensus Mechanisms	3 (Raft CFT, Istanbul pBFT, Clique POA Consensus)	1 (LibraBFT)
Tradable on exchanges	No	Yes
Settlements	Internal clients (current)	Partner institutions/Custody solutions
Collateralized	Yes / Fiat currencies on bank accounts	Yes / Financial assets (initially fiat currencies) in the Libra Reserve
Smart contract language	Solidity (or any EVM compatible language)	Move

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[2] Abraham, Gueta, Malkhi. Hot-Stuff the Linear, Optimal-Resilience, One-Message BFT Devil (2018). https://dahliamalkhi.files.wordpress.com/2018/03/hot-stuff-arxiv2018.pdf

Smart contracts and languages

[Smart contracts](#) will be written in **Move**, a programming language built for the Libra blockchain[3]
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According to the language whitepaper, Move is an "executable bytecode language used to implement custom transactions and smart contracts".

One of the features of this currently-permissioned blockchain is out-of-the-box smart contracts that are pre-approved for running on the network. However, these smart contracts will be the only ones that are able to be executed at the time of the network's launch. While this set up limits the possible functionalities on day one for companies and individuals adopting the chain, this limitation also reduces the likelihood of any error that occurs on chain, such as the Ethereum Parity Wallet incident[4] as the only functions allowed are peer reviewed amongst the consortium and in the open-source community.

To play around with the Libra testnet and read into further documentation, developers can access the [Libra Developer portal](#).

Further, with the large consortium of 100 parties, the number of use cases, needs, and desires to be pre-built can be fairly comprehensive, as the necessary smart contracts and tools needed from enterprise players can be sourced and polled directly from the consortium itself.

A Two-Token system

Just like in MakerDao's MKR (governance token) & DAI (stablecoin) system, and other two-token systems in the cryptoasset industry, there will be a governance token called the **Libra Investment Token (LIT)**, which will allow for participation in the governance of the network. The value of this token stems from the value of partaking in this governance, or potentially any revenues or rewards paid to network maintainers, and is decoupled from the day-to-day value of the payments token. Instead, the value of the governance token relies on the longevity and utility value of the payments token offered by the consortium.

However, it is important to note that nonprofits, NGOs, and other impact-oriented organizations may be able to participate in the governance without holding the minimum $10M worth of LIT. With many impact-oriented organizations conducting international payments and transactions, Libra's **lowered barrier to entry** for such institutions may be a **significant incentive for adoption**, as seen by the [already-announced participation](#) from 3 major social impact organizations: Kiva, Mercy Corps, & Women's World Banking.

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[3] https://developers.libra.org/docs/assets/papers/libra-move-a-language-with-programmable-resources.pdf
[4] https://blog.zeppelin.solutions/on-the-parity-wallet-multisig-hack-405a8c12e8f7

For regular, non-impact-oriented entities, it will be important to clarify down the road if this threshold to participate is measured in USD terms, or as a % of holdings of the total network (i.e. 1% assuming a max of 100 validators).

3. Global and local impacts

In this section, we will discuss impacts both from a local and global perspectives across three different time perspectives: short, medium and long term.

Short-term

In 2019, Libra will be tested with the network being experimented through a testnet. This live sandbox will enable third-party developers and any existing institution to experiment writing contracts and to get familiar with this new blockchain and its smart-contract interface.

Based on the existing list of initial participants[5], one of the most interesting exceptions is the absence of financial institutions. As discussed in our past report about stablecoins, non-financial companies are less risk-averse than traditional financial companies, and have greater incentive to disrupt the payments industry, with the added ability to execute at a faster, scalable pace.

Financial institutions, like banks, are currently testing out blockchain networks with XRP/Ripple services and JPM Coin/Quorum[6].

For Facebook, Whatsapp, and Instagram users, Libra is likely to **work its way into everyday apps,** starting with the Calibra wallet interface.

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[5] For the full list of initial backers.
https://www.theblockcrypto.com/2019/06/14/facebooks-cryptocurrency-partners-revealed-we-obtained-the-entire-list-of-inaugural-backers/
[6] Read our report about JPM Coin and the implications about the cryptocurrency and blockchain created by JP Morgan. https://info.binance.com/en/research/marketresearch/jpmcoin.html
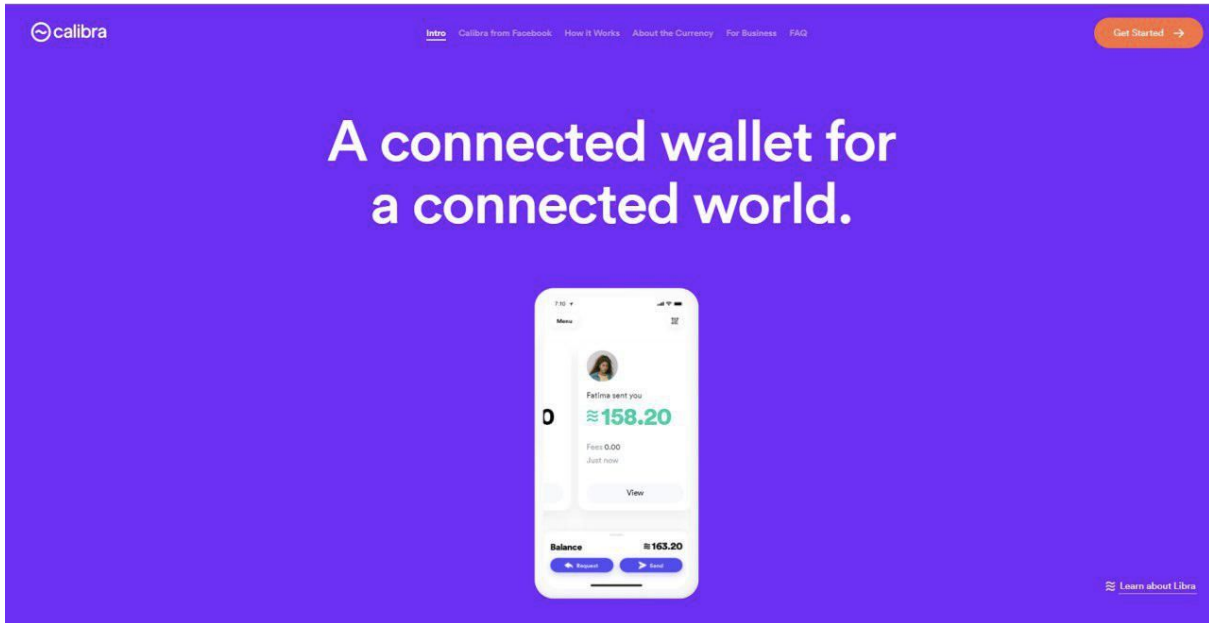
While the mainnet release is expected for 2020, at this stage, **no alternative competitor** to Libra is expected to emerge as a serious competitor on the same scale as Libra's initial pool of participants, which includes most of the largest companies in the fintech industry.

Compared to JP Morgan's Quorum permissioned infrastructure by design, the gradual shift from a permissioned network to a permissionless environment should encourage stakeholders to start building now to capitalize on **first-mover advantages** on the Libra ecosystem.

Medium-term

In the medium-term, we expect positive impacts both for Facebook as well as the crypto industry as a whole.

For Facebook - the Next Digital Frontier

In the past, Facebook has always devoted a significant amount of its resources into providing infrastructure for the world.

1. **Website authentication:** Facebook first offered its "Log-in with Facebook" authentication toolkits under its [developer portal](#), reducing the initial barriers into creating social apps, games, websites, and platforms. Today, even despite data and privacy concerns, many users ubiquitously "Log in with Facebook" to save a few clicks in the onboarding process of any new site.
2. **Mobile development:** in the last few years, Facebook has also produced, open-sourced, and supported its React Native framework, helping drive responsive app development across mobile and web platforms, again reducing the barrier to creating mobile/all-around interfaces for better user experiences. Now, many apps and

interfaces are built and maintained using React, helping cement Facebook as a player in the mobile world.

3. **Digital payments:** the crown jewel for providing tools in this open-source environment? An economic framework with yet another open-source tool like the Libra blockchain & Move language to yet again be at the forefront of opening up technology to the world. If companies, platforms, and marketplaces adopt this token as its default currency, it could allow Facebook to act as a key player in e-commerce of the future, while reducing the costs yet again for companies and individuals alike to build and do business.

For the crypto world - Increased Accessibility

Today, the cryptocurrency world, despite encompassing an aggregate $283B market capitalization (as of the time of writing), still faces challenges to see further global adoption. However, the Libra ecosystem looks to be uniquely positioned to broaden the reach and impact of the crypto world through increased accessibility and participation from the following:

1. **New on-ramping options**: Today, onboarding into cryptocurrencies requires access to fiat onramps or OTC desks that have the proper licenses to operate as a transaction facilitator. In the Libra world, initial onboarding into the cryptocurrency and digital currency world may be made possible without ever touching fiat. For instance, eBay or other marketplaces (e.g. Mercado Libre) participating in the initial consortium could help in spreading Libra into the wallets of millions of individuals by allowing individuals to sell or offer their resources and items directly for cryptocurrency. Mirroring BitTorrent's token ecosystem allowing individuals with internet connectivity to provide resources to earn crypto, initial custodian and internet partners may act as "atomic swaps" between physical, real resources and digital value. The network effects of allowing participating parties to achieve an even better value proposition, with more usage outlets and accepted platforms that connect users and consumers to producers.

2. **Additional arbitrage opportunities:** With Libra being traded against major cryptocurrencies such as Bitcoin, this creates arbitrage opportunities that may only be closed by trading the quote pair (in this case, Bitcoin) against each of the components in the Libra reserve basket. This multi-leg arbitrage strategy could lead to increased trading volumes and liquidity for cryptocurrencies worldwide. This may also attract **new institutional parties** into the trading of cryptocurrencies, provided that they have trading access to the fiat currencies featured in the Libra reserve.
3. **Increased competition for stablecoin issuers:** with its access to local custodian partners across many jurisdictions to allow for on/off ramping functionality globally, Libra may outpace some stablecoin issuers that are limited to singular issuances against individually-pegged currencies. Existing stablecoin issuers will be forced to maintain similar levels of transparency and ease-of-on-ramping in order to provide a comparable option to crypto users.
4. **Mass digital adoption:** finally, with a potential for many pairs on exchanges against both fiats, cryptos, and other marketplace assets, the Libra token itself could be uniquely positioned to gain mass digital adoption. In doing so, it paves the way for more end users by driving broader familiarity with blockchain technology, flattening the learning curve for everyday participants in the crypto ecosystem.
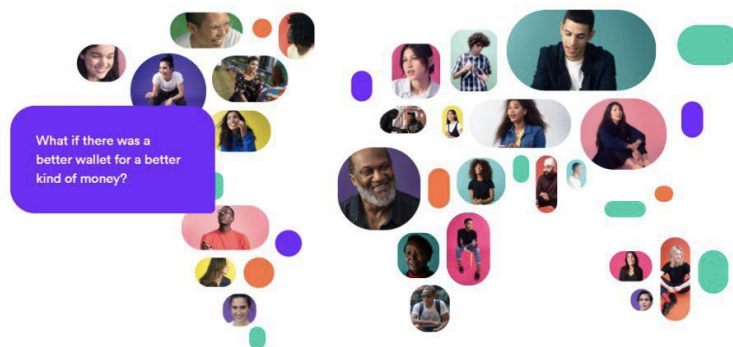
Long-term

Long-term impacts of Libra vary greatly from both an economic and financial perspective; a few potential macroeconomic implications include the following**:**

*   **Reshaping of the payment industry:** a new arena with a new set of gatekeepers will exist the digital world. In the ongoing debate about who will ultimately become the key providers of financial services in the mobile industry, the Libra ecosystem may result in "unbanking the banks".

- **Increasing offerings of financial services:** as what DeFi contributes to, this programmable blockchain can lead to the creation of new decentralized services for cryptoassets which would ultimately reinforce higher competition through lower barriers to entry for individuals. This could result in more efficient and competitive offerings for end-users.
- **Advancing greater freedom of money and lower capital restrictions worldwide**: as a basket of global currencies and financial assets, Libra, as a cryptocurrency, has the potential to contribute to added channels when individuals are looking for safe haven ("flight to safety"). With channels and markets against Libra, it may prevent central banks from adopting a monetary policy built on capital restrictions. Stablecoins and cryptocurrencies also serve this function in some countries, as illustrated by the premium on domestic exchanges in countries with capital restriction.
- **"Un-dollarization of the world" aka introducing a new unit of account for global trade:** if Libra were to be extremely used across the globe, this could (tentatively) lead to the creation of a new standard for global trade. "This global digit" can be seen as a functionable and tradable version of the SDR, proposed by the IMF. However, Libra is currently more restrictive (as it does not include the Chinese renminbi) as one of the constituents but its governance will be more decentralized. However this would result in **a shift in monetary economics from public officials to private corporations** which could ultimately hinder consumer rights and lead to new monopolistic environments in the global export/import industry.

Despite this initiative serving a long-term purpose for individuals and consumers worldwide, the Libra as an ecosystem and a cryptocurrency could also offer benefits for large stakeholders and financial institutions worldwide. Potential applications include:

- **Raising capital in a single unit:** for global companies wanting to raise money through a primary bond issuance, these companies could raise money in a "neutral currency" such as Libra instead of conducting multiple bond issuance in local currencies.
- **Settlement currency for global affairs:** in cross-border affairs, a global (neutral) currency could turn useful in order to mitigate litigations between two parties across different jurisdictions, with different domestic currencies, etc.

Eventually, in the long-term, this initiative could hinder the growth of end-user payment implementations for blockchains, such as [Bitcoin's Lightning Network](), unless Bitcoin were to be included as one of the reserve assets in the Libra basket of financial assets. However from a store of value, Libra (and other similar initiatives) could lead to new channels to enter in the industry and to invest in all cryptocurrencies and digital assets and these assets will continue to serve lots of functions which can cohabit with Libra.In short, Libra could further **contribute to bridging the cryptoasset and the off-chain economy in the long-term.**

4. Conclusion

Facebook's initiative, with the Libra cryptocurrency at the center of the project, will have a **significant impact** on the financial industry and global economies from both a medium and long-term perspective. Backed by a basket of fiat currency-denominated assets in its initial release, Libra represents a first attempt at creating a world currency, on-chain or not, with everyday usage by billions of individuals and institutions across the globe.

However, the magnitude of its success will vary greatly on **how Libra can convince regulators and financial institutions to collaborate** with the consortium in establishing an **agile** framework that satisfies the **need for decentralized governance** while being **compliant** with existing domestic and international regulations.

Other major factors include the **ability to scale** the Libra user base and to **build a trusted alliance of financial institutions that maintain custody** of the collateral reserves and **provide on/off-ramping functions** (i.e. fiat currency deposit accounts). Furthermore, the ability for the Libra foundation to **operate independently of Facebook**, in a similar manner as the existing separation between monetary policy and fiscal policy that occurs in developed countries, will be a key factor for **gaining the trust of the public**.

Whether or not it turns out to be one of the largest successes in the cryptoasset industry, Libra will likely contribute to **bridging the gap** between the right to access basic financial services and digitally-connected individuals that have remained unbanked across the globe.

There are still a number of question marks for Libra, including:
- The financial institutions that will partake in this consortium
- Further details on the staking rewards and costs / rewards of participation
- How Facebook may try to utilize this project in tandem with its Internet.org initiative to allow access to the Libra network without internet access
- What "Layer-2" dApps or tools may be built or incentivized to be built on Libra
- How the network may provide priority settlement to human-generated peer-to-peer transactions over programmatic smart contracts that may congest or flood the network

Despite these uncertainties, Libra has already laid out an extensive and well thought-out **groundwork for blockchain** technologies and **cryptocurrencies** to be **adopted** by traditional businesses and individuals alike.

Binance Research provides in-depth analysis and data-driven insights of digital assets by generating unbiased, institutional-grade research reports for investors in the crypto space.

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