Cryptocurrencies

Understanding Libra

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- Facebook recently announced its plan to launch the cryptocurrency Libra and the digital wallet Calibra in the first half of 2020.
- Despite its unique characteristics, we have more questions than answers on Libra at this stage given the uncertainties around its governance and regulations.
- Hence, from an investment point of view, we see limited near-term implications. We believe investors will continue to be rewarded by investing in our longer-term investment theme fintech as we believe the industry is at an inflection point favoring leading payment and fintech companies.

Source: Getty Images

Our view

For some years now, we have been maintaining a cautious view on cryptocurrencies, calling them a speculative bubble due to a lack of an intrinsic value and a failure to meet the basic principles of currencies (see our "Beneath the bubble" report published in October 2017). Last week, Facebook announced plans to launch a slightly different version ("stablecoin"), a cryptocurrency called Libra, backed by a reserve of low-volatility assets such as bank deposits and short-term government debt. The company also announced Calibra, a new, regulated subsidiary that will focus on financial services with an eponymous digital wallet for Libra. We see limited impact on the internet industry and the technology and financial sectors in the near term, but the cross-border payment or remittance market and a potential entry into banks' savings and investment business could be disruptive in the long term.

While we agree Facebook's crypto offering is unique, we are neither bullish nor dismissive of the Libra project given a lot of details about it are needed first. The project is interesting, but, equally, there are more questions than answers at this stage. As highlighted in our previous report on cryptocurrencies and blockchain, the success of Libra doesn't depend just on the technology itself, as we believe blockchain as a technology will continue to evolve. However, questions remain on Libra's governance, including: 1) how the consortium members plan to align their interests and work together and transition to a decentralized validation process in the future; and 2) how the currency can be independent without major privacy and security challenges. More important, it is not clear to us how Libra can comply to regulations across the globe given the initial pushback. Nevertheless, Libra as a project should be monitored, in our view, considering it not only is backed by many major companies but also has some unique features. We will address some of the most frequently asked questions about Libra in the next few pages.

Frequently asked questions (FAQs) on Libra

1. What is Libra?

Last week, Facebook announced plans to launch a new cryptocurrency called Libra, which will be governed by The Libra Association, headquartered in Geneva, Switzerland. The association aims to provide a framework and oversight for the cryptocurrency that will "enable a simple global currency and financial infrastructure that empowers billions of people." It was founded by an international consortium of public companies and private organizations. The founding members (see Fig. 1) will initially serve as "validators." Facebook also announced its plan to launch Calibra, a new, regulated subsidiary that will focus on financial services with an eponymous digital wallet for the new cryptocurrency Libra. We note that Calibra will be available as a stand-alone wallet as well as integrated into Messenger and WhatsApp, potentially allowing this digital wallet to scale up much faster given the extremely large installed base (see Fig. 2). Facebook says data from the Calibra wallet will be segregated from Facebook's ecosystem.

Libra is a new cryptocurrency based on the Libra blockchain. It has some unique features.

First, Libra will be a permissioned blockchain, at least for the initial five years, compared to most popular blockchains, which are permissionless. In a permissionless blockchain, anyone who can satisfy technical requirements (primarily a supply of computing power) can function as a blockchain node, which is a member of a blockchain community that provides the hashing required for transaction processing and storage of transaction records. Permissionless blockchains represent the ideal distributed ledger. By contrast, a central authority (The Libra Association, in this case) grants the right to function as a validator. As the name suggests, a validator is a member of the Libra blockchain that validates the Libra blockchain by maintaining a history of all transactions on the blockchain, as well as the "state" of the blockchain over time.

Second, the notion of validators sanctioned by a central authority in our mind makes Libra somewhat like a hybrid blockchain, i.e., some public attributes in that any individual can use the network, but some private attributes as well in that the public generally doesn't participate in the blockchain processing.

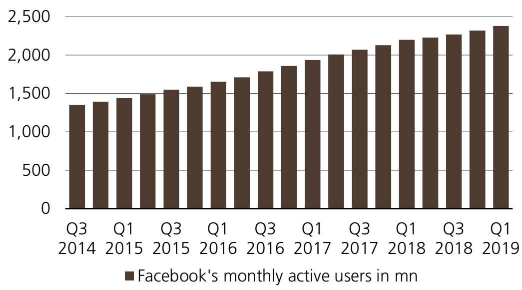
Third, the Libra currency will be backed by the Libra reserve in an effort to provide stability and increase its appeal as a store of value. The Libra reserve will hold a variety of low-volatility assets such as bank deposits and short-term government debt. Libra will not be pegged to any single currency, and its value relative to any one currency should more or less correlate to the relevant assets held by the reserve. Holders of Libra will not receive the interest earned by the underlying securities, which instead will be used to fund the operations of the Libra blockchain, help defray transaction costs, and pay dividends to The Libra Association's founding members. The reserve will include a mix of short-dated stable and liquid assets like bank deposits and government securities intended to provide Libra's users with confidence that their value will be preserved and subjected less to speculative swings.

Fig. 1: Founding members of The Libra Association

- Payments: MasterCard, PayPal, PayU, Stripe, Visa
- Technology and marketplaces: Booking Holdings, eBay, Facebook/Calibra, Farfetch, Lyft, Mercado Pago, Spotify AB, Uber Technologies
- Telecom: Iliad, Vodafone Group
- Blockchain: Anchorage, Bison Trails, Coinbase, Inc., Xapo Holdings Ltd.
- Venture capital: Andreesen Horowits, Breakthrough Initiatives, Ribbit Capital, Thrive Capital, Union Square Ventures

Source: The Libra Association, UBS, as of June 2019

Fig. 2: Facebook's monthly active users



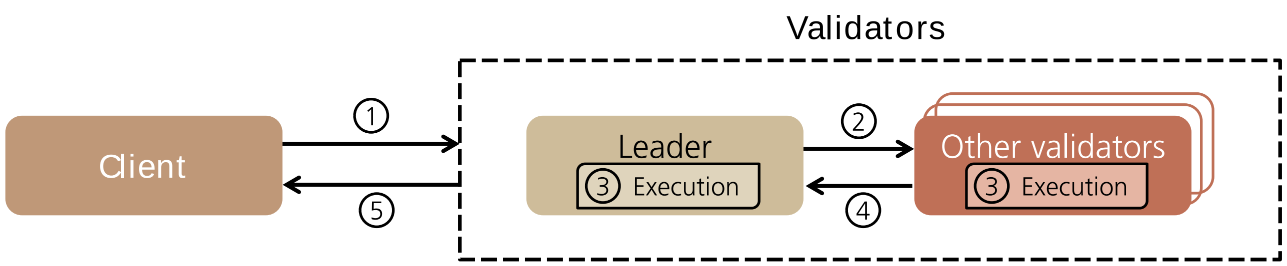
Source: Company reports, Bloomberg Intelligence, UBS, as of June 2019

2. How does Libra protocol work?

Libra runs on a blockchain that is an authenticated database maintained using the Libra protocol. Fig. 3 shows an overview of Libra protocol according to the technical white paper. The two major participants in the network are clients and validators. Clients are end-users who submit transactions or perform queries within the blockchain network. Validators maintain the database and process transactions submitted by clients for inclusion in the database through a consensus mechanism, which also selects a leader among the validators. There are five major steps involved in this process: 1) clients submit transactions to be included in the database; 2) the leader proposes transactions, both those directly submitted to it by clients and those indirectly submitted through other validators, to the other validators; 3) all validators execute the transactions and form an authenticated data structure; 4) as part of the consensus protocol, validators vote on the authenticator for this data structure; and 5) the consensus protocol outputs a signature on the full state of the database including its entire history. The Libra protocol leverages the new Move language to execute the transactions and adapts the BFT (Byzantine Fault Tolerance) approach to facilitate agreement among validator nodes on transactions to be executed.

The Libra blockchain is designed to deliver high performance across three key vectors: throughput, which is the number of transactions the blockchain can process per second; latency, or the time difference between the submission of a transaction to the blockchain and the network seeing that the transaction has been committed; and capacity, which is the ability to store very large numbers of accounts. The Libra blockchain is expected to support 1,000 payment transactions per second with a 10-second latency. In comparison, Paypal said that in its most recent quarter it processed 2.8 billion payment transactions, or 360 transactions per second. Over the past year, Bitcoin's confirmed transactions per day have ranged from 155,685 to 452,646, according to Blockchain.com. This is equivalent to between 1.8 and 5.2 transactions per second. Median confirmation time over the past year has ranged from 5.7 minutes to 17 minutes. The white paper clearly highlights that the protocol and the implementation process are still a work in progress with ongoing improvements expected. More details can be found in the technical paper.

Fig. 3: Overview of Libra protocol



Source: The Libra Association, UBS, as of June 2019

3. What are stablecoins?

Given that Libra aims to be a stablecoin, let's look at how stablecoins work. Stablecoins are cryptocurrencies issued with the primary objective of reducing price volatility backed by a collateral. In the most standard form of collateralized stablecoins, issuers peg the value of the coin to some other assets like a currency (USD or GBP) or commodity (gold, oil) and back up the value of the coin by continuing to hold on to the assets. In another form, the value of the stablecoin is pegged to another cryptocurrency like Ether. Unlike the standard collateralized stablecoins, in these type of stablecoins, algorithms play an important role managing the demand and supply of stablecoins so that they match the crypto assets held in the reserve. While the name "stablecoins" suggest some form of stability, it doesn't mean they are not volatile. For instance, stablecoins backed by other crypto assets can be highly volatile if the underlying crypto assets exhibit high volatility. Similarly, if issuers commit fraud, do not fully invest in the underlying asset, or do not continue to maintain the peg, a significant deviation in value can occur.

According to Blockchain.com and Bloomberg Intelligence, as of February 2019, there are 50 stablecoins, of which 26 have been released and the rest are expected to be launched by the year-end, and the total stablecoin market value was close to USD 3bn, almost double versus last year. Some of the most popular stablecoins are Tether, True USD, Dai, and Gemini Dollar. While most stablecoins are backed by private enterprises currently, we believe some governments in the future may consider some form of stablecoins if they get serious on blockchain implementation. Fig. 4 summarizes the key relative advantages and disadvantages of stablecoins.

Fig. 4: Pros and cons of stablecoins

Pros	Cons
Less complicated compared to other crypto	Requires huge trust on the issuer
Lower volatility compared to other crypto	High scalability is a challenge
Leverages blockchain & crypto technology	High liquidation and compliance costs
Collateral provides some valuation support	Regulatory challenges remain

Source: UBS, as of June 2019

4. What are Libra's similarities with other cryptocurrencies?
Considering Libra is a cryptocurrency, it has many similarities with other cryptocurrencies. We believe The Libra Association has extensively studied the current crypto market going by the diverse background of the authors of its technical working paper and the multiple features it emulated, which are somewhat similar to other cryptocurrencies. The most glaring similarity with Bitcoin or Ethereum includes pseudonymity or the lack of real identity. The white paper clearly highlights this: "Libra protocol does not link accounts to a real-world identity. A user is free to create multiple accounts by generating multiple key-pairs. Accounts controlled by the same user have no inherent link to each other. This scheme follows the example of Bitcoin and Ethereum in that it provides pseudonymity for users."

Source: Getty Images

Our initial impression is that the currency is closer to Ethereum than to Bitcoin as it has other similar features such as evolution to proof of stake and programmability. Like Ethereum, Libra is programmable, where the new programming language, Move, will allow user-defined codes and data-types, including "smart contracts" via modules that could open up future new applications and use cases. Meanwhile, while Bitcoin currently uses proof of work to validate transactions burning significant resources and wasting computing power and electricity during the process of mining, like Ethereum, Libra plans to transition into a proof-of-stake consensus mechanism. The white paper elaborates this: "We did not consider proof-of-work based protocols due to their poor performance and high energy (and environmental) costs…we plan to gradually transition to a proof-of-stake system where validators are assigned voting rights proportional to the number of Libra coins they hold." That said, initially, the network is permissioned, where the founding members of The Libra Association will run nodes on the network, validating transactions. This initial permissioned mechanism is closer to Hyperledger blockchain implementation. Finally, the other notable similarity we found to another crypto protocol Coda is the disposal of historical data. The white paper highlights that "historical data may grow beyond the amount that can be handled by an individual server. Validators are free to discard historical data not needed to process new transactions; however, this data may be of interest to clients who wish to query events from past transactions. Since the validators sign a binding commitment to this data, clients are free to use any system to access data without having to trust the system that delivers it. We expect this type of read traffic to be easy to scale through parallelism."

However, there are quite a few differences when compared with other cryptocurrencies. The original impetus for cryptocurrencies was a decentralized store of value that was not subject to intervention or regulation by either a central monetary authority or a government. Libra is slightly different from other cryptocurrencies as its proposed structure aims to maximize stability and utility for users in order to overcome the significant volatility challenge posed by existing cryptocurrencies (such as Bitcoin and Ether).

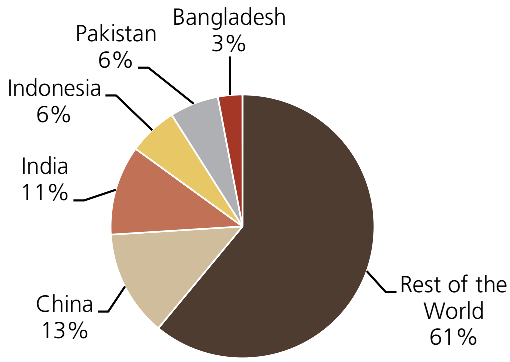
In summary, Libra sits somewhere in between the traditional notions of a cryptocurrency and the accepted views of fiat currencies.

5. What are the limitations of Libra?
While we acknowledge that the Libra project is still a work in progress at this stage, we see more questions than answers, which are primarily centered on its governance and regulations. For instance, it is not clear to us how the consortium members can continue to align their interests and work together and transition to a decentralized validation process in the future. The handover process to decentralized proof-of-stake validation is not clear. Similarly, questions on privacy and security still remain. For example, it is not clear to us how frequently the validators change or how security is maintained when new validators join. Similarly, to gain trust, The Libra Association may have to ensure that the members or validators are running the Libra network independent from all other internal company systems. While we will address regulations next, compliance related to anti-money laundering (AML) or KYC (know your client) is another challenge that needs to be addressed, in our view. Similar to a cryptocurrency, Libra is not issued by government fiat. But by anchoring the value to deposits on reserve on a one-to-one basis (i.e., 100% reserved), Libra seems to be at risk of being debased over time due to inflation, whether intentional or not. We note that The Libra Association states it "...decided not to develop its own monetary policy but to inherit the policies of the central banks represented in the basket." Lastly, in contrast to other cryptocurrencies, Libra does not seem to be fully decentralized (at least initially) given that it relies on validators approved by The Libra Association.

6. What are the regulatory implications?
Considering Libra's mission is to become a global currency, the cryptocurrency will inevitably be subject to regulations across the globe. With lingering trust issues surrounding the broader Facebook platform, Libra within a few days attracted regulatory scrutiny across markets like the US, the UK, France, and Germany. Beyond the near-term overhang, it is worth monitoring regulatory response to Facebook's Libra project in both developed and emerging markets. For instance, China, India, and Indonesia account for 30% of the 1.7 billion unbanked population globally (see Fig. 5) where crypto regulations are very tough, so it remains to be seen how Libra can succeed in these markets. While it is likely that stablecoins may fall under the scope of the US SEC given that they may be considered as structured products, in other markets stablecoins pegged to legal fiat currencies may be considered as digital money and subject to additional regulations. In summary, we believe, regulations including how The Libra Association ensures high AML and KYC standards remain a key risk to the success of the project.

7. What are the implications to the internet industry and the technology sector?
We will try to assess the impact of Libra's announcement on the internet industry and the technology sector, both in the near term as well as the medium to long term. In the near term, we do not expect a significant impact on the internet industry and the technology sector. Directly, we believe the interest income earned on the reserve will be too small to move the needle for the sector's profitability in the near term. Indirectly, too, we believe unlike other cryptocurrencies like Bitcoin, Libra is not technologically intensive from an infrastructure point of view.

Fig. 5: About 30% of world's unbanked population live in China, India, and Indonesia



Source: World Bank Global Index, Bloomberg Intelligence, UBS, as of June 2019

For instance, assuming each transaction on the Libra network requires 5KB of traffic, validators require only a 40Mbps internet connection to support 1,000 transactions per second, according to the white paper. From a processing point of view, unlike Bitcoin which requires much computational capacity, Libra is less intensive; the 1,000 verifications per second, as the working paper highlights, can be supported by a commodity CPU. Finally, since Libra allows for the disposal of historical data, it is also less storage intensive.

In the medium to long term, Libra can provide interesting growth opportunities, which include the potential dawn of the "data dividend." Facebook cofounder Chris Hughes argued in a 2018 editorial that individuals should be paid a data dividend funded by a tax on companies whose business models depend on individuals' data. More recently, Brave, a provider of a blockchain-based browser, announced a new revenue-sharing model in which consumers will receive up to 70% of advertising revenue. Consumers who join the Brave advertising program and use the Brave browser will be paid monthly in Brave Attention Tokens (BATs) based on the amount of advertising viewed. Importantly, Brave does not store consumers' personal information, and consumers opt in to the types of advertisements they wish to use.

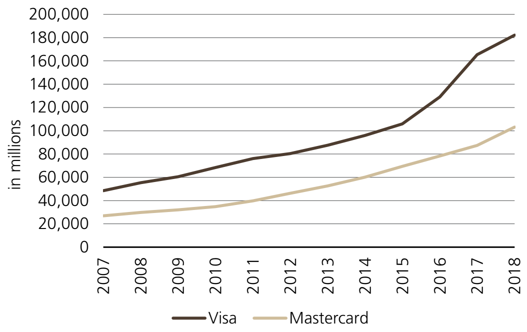
Given Libra seems to be purpose-built to have massive scalability, low latency, and high capacity, along with a focus on micro transactions, we wonder if the internet advertising model could change over time to paying users for consuming advertisements. If this were to happen, we believe other participants in the digital advertising ecosystem would potentially have to adopt a similar strategy. A change to a pay-for- data/engagement model will undoubtedly take some time. If successful, Libra in a regulatory compliant environment should encourage more activity across the Facebook family of apps by its 2.4 billion monthly active users. We note that Calibra will be available as a stand-alone wallet as well as integrated into Messenger and WhatsApp, potentially allowing this digital wallet to scale much faster given the extremely large installed base.

In summary, we see limited near-term implications for the internet industry and the technology sector; but in the longer term, Libra, if successful, can provide interesting opportunities in the digital advertising industry.

8. What are the implications on financial sector?

Considering the vision of Libra is to create a currency that is efficient, is ubiquitous, costs lower, and can work globally, Libra is clearly targeting the retail payment industry rather than other segments within the banking industry. Despite more than a decade of existence, cryptocurrencies constitute a very small percentage of overall retail payment transactions. While it is likely that Libra may eventually play a major role in global payments, we do not foresee a near-term threat to the market shares of existing payment companies. The main incumbents in the payment system today, including banks, card issuers, networks, and merchant acquirers, enjoy several well-established advantages over any prospective disruptive threats. Fig. 6 shows how the two leading payment network companies processed billions of transactions last year. Most companies in today's payment industry also have brand identity and loyalty based on the security of a regulated and tested system.

Fig. 6: Visa and MasterCard processed around 285 billion transactions in 2018



Source: Company reports, Bloomberg Intelligence, UBS, as of June 2019

Meanwhile, the current systems in place work very well and are relatively inexpensive and seamless for consumer users and are being increasingly adopted for commercial payments. The costs associated with payments today mostly reflect regulatory compliance costs as well as user protections including fraud and loss insurance. Value-added costs driving interchange fees are primarily driven by rewards used to incentivize adoption relative to alternative payment forms (checks and cash). That said, while we believe that the perception that the current system is expensive is exaggerated, to the extent that Libra is able to bring down transaction costs, it could drive adoption over time. In our view, as Libra is initially seeking to mostly solve social problems, such as providing broader access to payment services to the 1.7 billion people around the world who currently lack access, it is unlikely to have a major near-term impact on existing payment providers.

The social aspirations of Libra are generally focused on the democratization of payments. Financial inclusion is a worthy aim; however, the unbanked and underbanked are typically not the target market for established payment service providers. Nevertheless, to the extent that Libra provides efficient cross-border payment capabilities, there is potential for fee pressure on payment networks' cross-border volumes, which tend to be priced higher versus domestic transactions.

Meanwhile, the impact on the banking industry is not straightforward. Assuming Libra targets payments, we think potential disruption risks for the overall banking industry are manageable in the near term. The payment business segment currently accounts for just 7% of the total profits of the global banking industry (see Fig. 7) . While any potential disruption from Libra is not positive for banks' earnings, we do not think that the new technologies present a serious challenge for the banks' business models, at least in the short term. In addition, we believe that most of the disruption caused by Libra will be in the personal banking business, which accounts for just 4% of the banks' profits, further limiting the potential initial impact on the banks' business models. The bulk of the bank earnings are derived through the lending business, which requires a deep expertise and knowledge that are not replicable in the short term by the disruptors approaching the financial industry. Therefore, we do not expect the new technologies to quickly substitute banks.

Conversely, we acknowledge that offering payment services will be the first step to gain clients' trust; and in the medium to long term, payment solutions like Libra can allow expansion into the savings and investment businesses. They make up a sizable 21% of the global banks' profits, which could then be at risk. As such, we view the expansion of disruptors like Libra into payment services, once a monopoly of the banking sector, as a manageable headwind for financials, while it could result in a more serious challenge to the banks' business models in the medium to long term.

To summarize, it is unlikely that Libra may disrupt the traditional payment network companies in the near term given the relatively efficient structure of today's payment network and solid fraud detection capabilities. However, in the medium to long term, the cross-border payment or remittance market and a potential entry into the savings and investment businesses could be disruptive.

Fig. 7: Global banks' profit breakdown, by product and customer segments

Profit split by customers segments based on company reports and by product segments based on banks that disclose revenues split by products

Customers / Products	Payments	Savings and investments	Lending	Capital markets	Total
Personal/SME	4%	12%	29%	1%	46%
Corporate	3%	6%	21%	5%	35%
Investment Banking	0%	3%	6%	10%	19%
Total	7%	21%	56%	16%	100%

Source: Citigroup, UBS, as of June 2019. SME = small and medium-sized enterprises

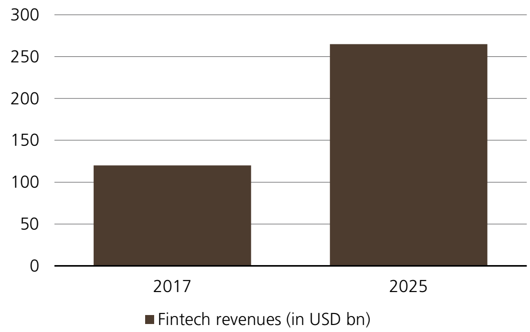
9. What are the investment implications and other conclusions?

With limited near-term impact seen across most areas like the internet industry and the technology and financial sectors, coupled with some uncertainties around Libra's successful implementation, we believe the direct beneficiaries are limited at this stage. However, it is worth highlighting that Libra plans to disrupt the traditional banking industry, which is already being targeted by many listed fintech companies. Hence, to play the broader trend of financial service disruption, we believe investors will be better rewarded today by investing in a diversified group of fintech companies like payment industry leaders, technology companies launching disruptive fintech services, and incumbent financial companies with a clear fintech strategy.

As highlighted in our longer-term investment theme "Fintech," published in August 2018, the global financial service industry is at an early stage of a major digital transformation powered by fintech, which is the confluence of financial and technology-driven innovation. Driven by rapid urbanization, strong demand from millennials, and favorable regulations, we believe the global fintech industry is at an inflection point and set to drive a major digital transformation in the financial service industry.

We expect global fintech revenues to grow from USD 120bn in 2017 to USD 265bn in 2025, implying an average annual growth rate about three times faster than the broader financial sector's. With likely strong growth seen across fintech verticals over the next few years, we are still in the early stages of rising fintech adoption. Our estimates of rising fintech penetration rate from low single-digits to mid-single-digits by 2025 may be very conservative, given the potential upside risk of a strong uptake in emerging markets.

Fig. 8: Global fintech revenues expected to post CAGR of 10.5% during 2017–25



Source: UBS estimates, as of May 2018

Appendix

Terms and Abbreviations

Term / Abbreviation	Description / Definition	Term / Abbreviation	Description / Definition
A	actual i.e. 2010A	CAGR	Compound annual growth rate
COM	Common shares	E	expected i.e. 2011E
Shares o/s	Shares outstanding	UP	Underperform: The stock is expected to underperform the sector benchmark
CIO	UBS WM Chief Investment Office		

Appendix

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Appendix

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