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## What is Libra? Understanding Facebook's currency

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Maik Schmeling

# What is Libra? Understanding Facebook's Currency

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# What is Libra? Understanding Facebook's Currency

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## Abstract

*Facebook's proposal to create a global digital currency, Libra, has generated a wide discussion about its potential benefits and drawbacks. This note contributes to this discussion and, first, characterizes similarities and dissimilarities of Libra's building blocks with existing institutions. Second, the note discusses open questions about Libra which arise from this characterization and, third, potential future developments and their policy implications. A central issue is that Libra raises considerable questions about its role in and impact on the international monetary and financial system that should be addressed before policymakers and regulators give Libra the green light.*

## I. What is Libra?

According to the Libra White Paper (2019), Libra is a “global currency and financial infrastructure” composed of three parts. First, Libra is a blockchain-based digital currency. Second, it shall be backed by a reserve of assets which is designed to keep its value stable. Third, it will be governed by an independent organization (the Libra Association) which is tasked with developing the currency's ecosystem.

While the Libra White Paper and other information released so far do not provide enough details on all aspects of the final implementation, a few features of the proposed currency and its ecosystem are reminiscent of existing institutions, such as currency boards, exchange traded funds (ETFs), and special drawing rights (SDRs), and allow for a rough characterization of the different angles of the project.

### 1. Libra as a currency board

A key goal is to make Libra a stable currency (a so-called stable coin), which is not subject to the wild price fluctuations experienced by other digital currencies. The plan to achieve this is to back the entire stock of Libra with liquid and safe reserve assets held in stable currencies of major countries. Put differently, the value of one Libra will be fixed against a particular basket of currencies. New Libra can only be created when new assets are added to the stock of reserves and vice versa. This feature is reminiscent of a *currency board*, which aims to fix the exchange rate of a local currency against a

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<sup>1</sup> SAFE Policy Paper repräsentieren die persönlichen Ansichten der Autoren und nicht notwendigerweise die von SAFE oder seiner Mitarbeiter.

particular reserve currency. The key idea of a currency board is to achieve a stable exchange rate by backing each unit of domestic currency issued by the board with an equivalent amount of safe, liquid assets in the foreign currency at the fixed exchange rate. For example, Hong Kong has operated a currency board against the US dollar since 1983 whereas Bulgaria has fixed the Lev against the Euro (and against German marks before that).

A stylized balance sheet of a currency board is depicted below. A currency board holds safe liquid reserve assets to back the issuance of local currency (and maybe bank deposits) such that the stock of issued currency is equivalent to the amount of foreign currency reserve assets evaluated at the fixed exchange rate. A common procedure is to back the stock of domestic currency ("Cash") by more than 100% with assets in the reserve currency to guard against losses in the stock of assets (even though these should be limited due to fact that reserves are held in short-term, liquid assets). For this reason, the liability side also includes some net worth (equity).<sup>2</sup> A well-functioning currency board thus guarantees convertibility of local into foreign currency by means of the stock of reserve assets which more than cover the domestic monetary base.

**Table 1. Currency board**

Assets	Currency board	Liabilities
Reserve-currency assets (anchor currency)		Cash (local currency) Net worth

The system proposed in the Libra White Paper suggest the following stylized balance sheet for the Libra Reserve. On the liability side, there will be some net worth<sup>3</sup> and the Libra coins issued to users of the currency. The asset side is announced to consist of high quality, safe, liquid short-term assets (and bank deposits) in a basket of foreign currencies. This setup closely resembles the setup of a currency board shown above even though there are some important differences discussed below.

**Table 2. Libra Reserve**

Assets	Libra Reserve	Liabilities
Reserve currency assets (basket of stable currencies)		Libra coins Net worth

<sup>2</sup> A common target would be a 105-110% backing of domestic with foreign currency reserve assets. Retained profits from interest earned on the stock of reserve assets are used to build up and maintain this target. Excess profits are then typically transferred to the government's budget.

<sup>3</sup> Libra founding members will have to pay at least \$10 million to become a node operator and to join the association. Moreover, some net worth (equity) seems necessary to get the system operational.

Questions are raised whether Facebook or the Libra Association Members will become a sort of central bank due to Libra. Therefore, it is worth noting that a currency board and the proposed Libra setup are quite different from that of a standard central bank, for which a stylized balance sheet is shown below. Central banks also issue cash (and accept bank reserves) just like currency boards but their asset side is comprised of more than just liquid reserve assets and additionally comprises government debt of various maturities and potentially other financial assets and loans (e.g., corporate credit instruments, mortgage-backed securities, etc.) which are deemed necessary for the conduct monetary policy. In that sense, the monetary base is not just backed by a stock of liquid foreign currency reserves but by a broader portfolio of financial assets, not all of which are short-term and/or liquid and which are mostly denominated in domestic currency.

**Table 3. Central bank**

Assets	Central bank	Liabilities
Gold and reserve assets		Cash
Government debt		Deposits/Reserves
Other assets/Loans		Net worth

Importantly, though, Libra is not special in the sense that it's "fully backed by assets". Any fiat currency issued by a central bank is fully backed by other assets as well. The special feature of Libra is that, like a currency board, it only holds short-term, liquid, safe reserve-currency assets and that it does not actively manage the size of its balance sheet to conduct monetary policy. A central bank on the other hand can and does hold other and less liquid assets and can, e.g., adjust the size of its balance sheet to conduct monetary policy or to backstop the financial sector in times of a financial crisis.

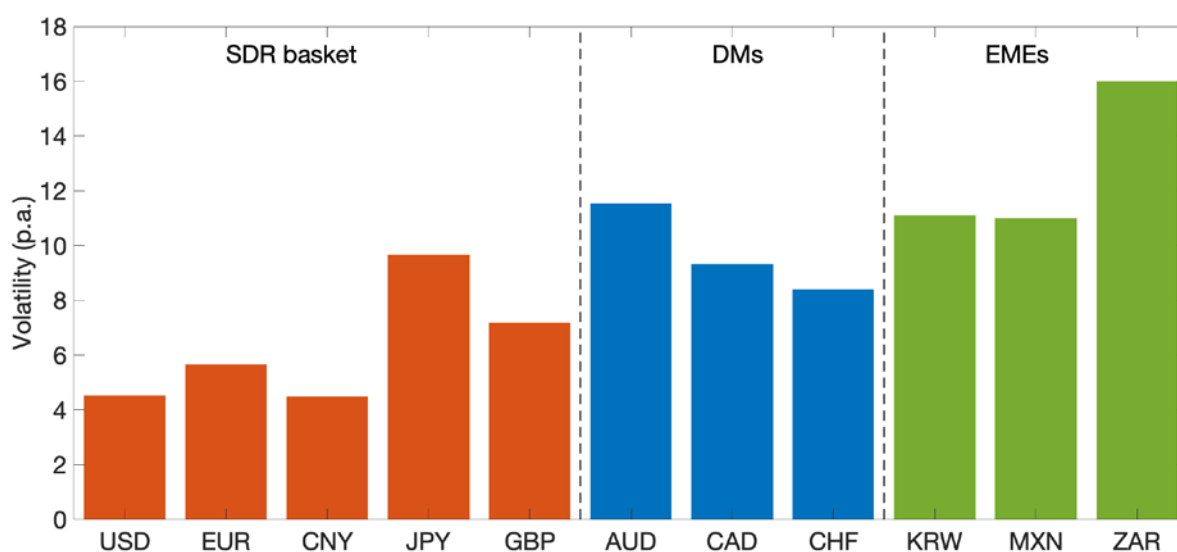
In sum, there are some similarities between Libra and a currency board but Libra also differs in a number of ways. One difference is that a plain vanilla currency board fixes its local currency to *one* foreign anchor currency. From a technical point of view, there is nothing special about setting up a currency board against a basket of foreign currencies but this has not been done traditionally.

A second but related difference is that a traditional currency board is responsible for a well-defined geographical region, issues currency to the residents of this region and tries to maintain the value of the *domestic* currency, in which prices and taxes in this country are quoted, against an anchor currency. For example, a resident of Bulgaria will be able to exchange one Lev for 0.51 euros as long the currency board is maintained. Libra is different in the sense that it is not the currency of a particular region, but a global currency, which means that it does not guarantee a fixed exchange rate in terms of anyone's home currency against any other currency (or a basket of currencies) as long as prices, taxes, etc. in a country are still quoted in local currency. Hence, Libra is not a "safe" currency for any country's

residents in the sense that its value will fluctuate in terms of the domestic currency for all potential users.

To give a sense of the volatility of such a currency basket in terms of domestic currencies, the figure below shows annualized volatilities of different national currencies in terms of the International Monetary Fund's (IMF) special drawing rights (SDRs).<sup>4</sup> These annualized volatilities range from about 4% per year for the US dollar (which has the largest weight in the SDR basket) to about 16% for South African Rand. The main point is that holding a basket of "stable foreign currencies" does not necessarily imply low or zero volatility, even for people living in countries with stable and low inflation.

**Figure 1**



This figure shows annualized return volatilities of national currencies (NC) expressed in SDRs (NC per SDR). The first five currencies (in orange) are included in the SDR itself. The blue bars are examples for major developed countries' currencies, whereas the green bars are examples for emerging market countries' currencies. Source: All data are from the International Monetary Fund and span the period from 2004/08 – 2019/08.

Put differently, Libra will have a fixed value against a certain basket of foreign currencies but it will not have a fixed value for a US resident in terms of dollars, or for a Japanese resident in terms of Japanese Yen.

Finally, the stability of a currency board comes from the fact that the board announces a strong commitment to maintain the fixed rate by guaranteeing convertibility of local into foreign currency and to use its reserves to defend this rate. Libra will have to make a similarly credible announcement and it has to make sure that the composition of the reference basket will not be changed in a

<sup>4</sup> The SDR basket currently consists of US dollars (42%), euros (31%), Chinese yuan (11%), Japanese yen (8%), and Pound Sterling (8%) where the approximate basket weights are given in parentheses.

discretionary fashion so that a Libra coin represents a claim on the same set of assets over time. This issue seems even more crucial, as currency boards are by no means a guarantee for exchange rate stability and many currency boards have failed over time (see, e.g., Dominguez and Tesar (2007) on the Argentinian currency board).

## 2. Libra as a (money market) ETF

The Libra White Paper suggests that Libra shall be tradable against other fiat currencies through a network of “authorized resellers”, who can interact with the Libra reserve at a price equal to the value of the reserve basket. This is reminiscent of the way *exchange traded funds* (ETFs) are traded by “authorized participants” (AP) which can be large financial institutions (e.g., JP Morgan) or more specialized firms (e.g., Flow Traders). Moreover, ETFs have a similar structure as the Libra reserve in the sense that they issue ETF shares ( $\approx$  Libra coins) and hold a basket of assets ( $\approx$  the Libra reserve) to back the value of their shares. Specifically, since Libra is to be backed by a basket of liquid, short-term assets, Libra has some similarity with an (international) money market ETF.

The way ETF shares are created is as follows: Investors can buy ETFs on an exchange from an AP, who is now short ETF shares and will hedge this by buying the underlying basket of securities (the composition of which is determined by the ETF manager). At the end of each day, new ETF shares are created by the fund manager and delivered to the AP in exchange for the underlying basket of securities. The redemption of ETF shares is analogous. Hence, the ETF manager determines the portfolio weight of different securities whereas authorized participants handle the interaction with end investors and deliver securities to or obtain securities from the ETF portfolio.

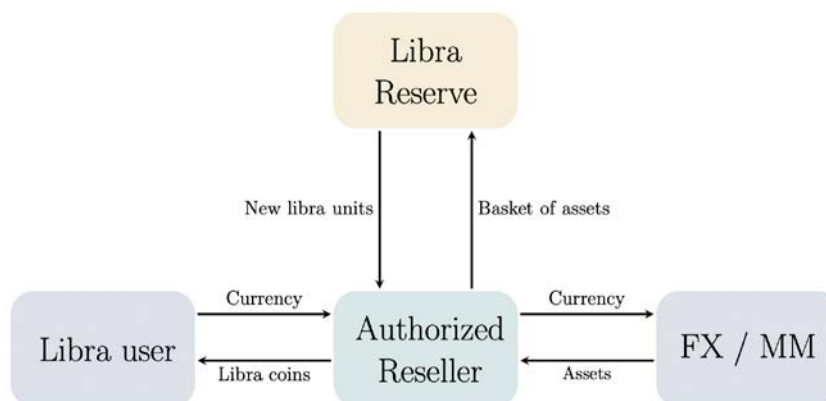
Translating this into the Libra setup, the creation of Libra via authorized resellers could potentially look like the process depicted in Figure 2 below (adopted from the ETF creation mechanism in Lettau and Madhavan, 2018).<sup>5</sup> The Libra Reserve determines portfolio weights, i.e., the portfolio weights of different currencies in the Libra reserve. If a Libra end user now wants to acquire, say, 100 new Libra coins, the user buys these Libra from an authorized reseller and pays with local currency. The reseller then delivers 100 Libra to the end user and is now short 100 coins. To cover this position, the reseller acquires the underlying assets (according to the portfolio weights supplied by the Libra reserve) in the foreign exchange (FX) and/or money market (MM). At the end of the day, the authorized reseller delivers the basket of assets to the Libra reserve and obtains new Libra from the reserve. Importantly,

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<sup>5</sup> The process described below is speculative in the sense that the operational details have not yet been provided but given the setup described in the White Paper and other information released so far, a mechanism along these lines seems plausible.

the reserve will only create Libra if the equivalent amount of reserve assets is delivered to back these new coins.

**Figure 2**



Potential mechanism for Libra creation.

Adapted from Lettau and Madhavan (2018)

If this were the process through which end-users can buy and sell Libra and interact with the Libra reserves, there are still some differences between Libra and an ETF. The most obvious difference is that ETFs are not used as a means of payment but for investment purposes. Moreover, profits from an ETF's holdings (such as interest payments) accrue to ETF investors. The Libra reserve, on the other hand, will not pay interest/dividends to Libra users but use this income stream to finance the operations of Libra. The latter feature might be relevant to avoid being classified as a security (which would likely face different regulatory constraints than a pure electronic means of payment).

## 2. Libra as an SDR

The Libra reserve shall be based on a basket of assets denominated in different currencies, which some commentators (e.g., FT Alphaville, 2019) have discussed in the context of the IMF's SDRs. The backing of Libra by a basket of (assets denominated in) different currencies is indeed reminiscent of the special drawing rights operated by the International Monetary Fund, which was already used above as an example to illustrate the volatility of currency baskets in terms of local currencies. The most obvious similarity is that SDRs are a currency issued by a global institution based on and backed by a basket of foreign currencies. A second similarity is more subtle, namely that the quantity of SDRs is fixed in the short run and cannot easily be changed at the discretion of the IMF (unlike base money by a normal central bank). To this end, it is instructive to compare the (stylized) balance sheet of the IMF below to the one of the Libra project.



**Table 4. International Monetary Fund**

Assets	International Monetary Fund	Liabilities
National currencies (Gold)		SDRs Net worth

Replacing SDRs with Libra on the liability side and “national currencies” (and “Gold”) by “liquid reserve currency assets” on the asset side, one ends up with the balance sheet of the Libra association depicted above. In this sense, Libra is structured like the IMF’s special drawing rights but augmented by an ecosystem of authorized resellers to facilitate the creation and redemption of claims on a basket of securities (Libra, SDR).

A key difference between the current Libra proposal and the IMF is, of course, the functionality of the two currencies. While Libra is set up to be a blockchain-based digital cross-border payment system for retail users, SDRs are not held by the public and not primarily used as a means of payment. Moreover, the IMF is a public institution whereas Libra will be dominated by private corporations.

## II. What Libra is not (yet)

In its current proposal, Libra is not yet like a standard bank or central bank. As discussed above, a bank (central bank) can create means of payment (base money) by *actively* expanding its balance sheet through credit operations. Similarly, a commercial bank can create new deposits by granting loans and expanding its balance sheet. The proposed setup of Libra does not have this feature as the size of its reserve is tied to end-user purchases and sales of Libra with other fiat currencies. However, if Libra were to be successful and widely adopted, it is hard to imagine that it could do without banking elements, an issue discussed in more detail below in Section 4.

Libra is also not inherently more stable than other fiat currencies. To this end the claim in the Libra White Paper that

*“Libra is designed to be a stable digital cryptocurrency that will be fully backed by a reserve of **real** assets” (Libra White Paper, emphasis added)*

is quite misleading. First the White Paper says that reserves are to be held in nominal assets (bank deposits and short-term, liquid bills) whereas real assets (such as land, housing, gold, equity) are not mentioned as being part of the reserve. Hence, the stability of the stock of reserves crucially depends on the stability of the underlying nominal assets, such as bank deposits and short-term government paper. Solvency problems, high inflation rates, or the security of bank deposits are outside of the control of Libra and still rest with the governments and central banks of the reference basket’s

countries. While a broadly diversified reserve may have some diversification benefits, it is by no means the case that Libra is a claim on real assets or per se “more backed” than other major currencies. While the inability of Libra to expand its balance sheet for seigniorage gains might be seen as an advantage by potential users, this inability might also become problematic in a run on Libra or times of stress in the Libra ecosystem. The Libra ecosystem has no built-in lender of last resort.

### **III. Some open questions**

What is the point of issuing Libra? If the goal is to have fast and global payments, this could have been achieved by offering a fast global payment system within Facebooks applications. Several such systems already exist (e.g., Paypal, Swift, etc.) but all of these systems work on top of the global banking system and allow users to store money in their own local currencies. Hence, for users in stable, developed countries, who do not want to diversify into other currencies, the benefit of Libra is not obvious.

One stated goal of Libra and central advertisement on its social benefits is to help the unbanked get access to financial services simply via their mobile phones. But how would these potential users acquire Libra in the first place? If one needs to buy Libra with fiat money, then how do people without a bank account buy them? Will there be local Libra intermediaries that trade Libra for cash? How does the know-your-principle work in this setting? Or is the plan that local employers pay wages in Libra? Will Libra spread via remittances from foreign workers to their home countries? More information on the specific ways in which Libra is to be distributed in countries without a well-developed financial system seems necessary to judge these prospects.

Abstracting from these questions, maybe the goal is to provide a safe asset for users in relatively unstable countries and/or countries with high inflation. But again, why does this require a new currency, instead of giving these people access to a cheap, “digital” money market ETF that can be traded via mobile phones? One reason could be regulatory constraints and that ETFs are less convenient because they cannot be used to make payments. Then again, such digital securities would at least allow for returns to be distributed to investors whereas Libra earn no interest. Finally, Libra could potentially be useful to circumvent capital controls, which is beneficial from the individual viewpoint of end users, but it is not clear that circumventing such controls via electronic currencies should be in the interest of national authorities who set macro policy.

Who will the authorized resellers be? Will these be the same banks/institutions that act as dealers/brokers in global money markets? Or will there be a new set of institutions to run this business? Who will regulate these institutions?

Will the Libra reserve be held in exactly the same proportion of assets that define its currency basket? If not, there is no guarantee that one Libra can always be exchanged for the basket of reference currencies (which is the currency board idea). However, to judge the Libra proposal more information on this question is crucial as it raises other questions. For example, suppose that the reference basket simply was identical to the SDR. What happens if there is strong demand for Libra from Australian users who buy Libra with AUD? Would this mean that the reserve composition is changed so that AUD can be added to the Libra reserve? Alternatively, will the portfolio weights of the reserve be held constant such that the authorized resellers have to sell AUD for the currencies that make up the SDR to add them to the stock of reserves? If so, an unintended consequence of widespread Libra adoption could be a depreciation of local currencies against the reference currencies which would not have happened in the absence of Libra (as Australians would probably not find it useful to hold SDR reserve currencies for pure transaction purposes).

#### **IV. Benefits and drawbacks of the current proposal**

##### **1. Potential benefits**

One clear benefit would be the provision of a fast and cheap payment system. While national payment systems in many developed countries already provide this functionality, cross-border payments and national payment systems in other countries in many cases do not or at high costs. A second benefit might be that residents of countries with unstable currencies could use Libra as simple-to-access store of value. As discussed above, however, it is not at all clear why a *new currency*, issued by private corporations, is needed to achieve these goals and whether better alternatives exist to achieve this. Third, the existence of Libra could have a disciplining effect in the sense that a readily available currency substitute forces national central banks to follow a policy that aims for low inflation and a stable exchange rate. Fourth, depending on the final implementation, a blockchain-based ledger could be useful to track money laundering activities more easily.

##### **2. Potential drawbacks**

The reserve's currency basket shall be based on stable currencies with large trading volume (tens or hundreds of billion in trading volume as per the Libra White Paper). If this were to be adopted in the final implementation, it implies that only a few major currencies are suitable for the reserve. If Libra were to be adopted on a large scale, this would imply a large concentration of holdings of reserves in these currencies which can increase systemic risk. A run on Libra then implies large-scale sales of reserve assets and a redemption of bank deposits at fire sale prices which all the associated problems

know from earlier runs on banks or, e.g., money market mutual funds. Moreover, a likely consequence of issuing one global currency but backing it only by a handful of reserve currencies is to increase contagion and spillover effects. A run on Libra by residents of some countries would spill over to financial markets of reserve currency countries. Since there is no institution behind Libra that could act as a backstop in such cases, these questions should be addressed before Libra is adopted.

Similarly, the Libra reserve will act as another large-scale cash pool that needs to be managed and invested in safe assets which might potentially exacerbate the safe asset shortage problem (cf. Caballero et al., 2017).

A part of the Libra Reserve is announced to be held in bank deposits.<sup>6</sup> Deposit insurance is limited to relatively small amounts and would certainly not cover the size of Libra's deposits. Hence retail clients in countries with deposit insurance might unknowingly swap an insured bank deposit in their local currency for an asset that represents a claim on a (partly) uninsured asset. One option here might be to give digital currencies like Libra access to central bank reserve accounts (e.g., Adrian and Mancini-Griffoli, 2019) if they satisfy certain regulatory criteria to provide a safe asset and to overcome market and liquidity risk. Finally, the Libra Reserve would have large market power in negotiating deposit rates with banks which will likely lead to an erosion of profits.

A large-scale adoption of Libra could lead to a significant impairment of the transmission mechanism of monetary policy and the central bank's control of the payment system, which interacts with Libra's policy to hold reserves in stable and safe currencies. These currencies are safe and stable partly because they are backstopped by central banks in times of crises and by an active monetary policy that aims for low and stable inflation in normal times. An unintended side effect of Libra could thus be to limit central banks' abilities to perform these functions, thereby weakening the safety and stability of Libra's reserve assets.

To sum up, there are a number of potential drawbacks and open questions which would have to be addressed before giving the green light to Libra. A relevant question in this context is, how *national* regulators and policymakers can hope to address these issues of a global currency and make sure that the external costs of Libra on the financial system are internalized by the firms that operate it?

## V. Potential future developments

Widespread Libra adoption will create a strong demand for derivative and credit products in the Libra ecosystem. For the sake of illustration, imagine, first, a firm that, say, quotes prices in Libra because

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<sup>6</sup> The maximum amounts covered by deposit insurance vary by country. For example, in the US the FDIC guarantees up to USD 250,000 whereas Germany and the UK have a limit of EUR 100,000 and GBP 85,000, respectively.

residents of this country have adopted Libra on a large scale. Such firms face Libra exchange rate risk against their domestic currencies (in which taxes are quoted) and, to hedge these exchange rate risks, there will be a strong push to introduce Libra derivatives. Second, firms doing business in Libra and consumers transacting in Libra will have strong demand for supplier and customer loans denominated in Libra to avoid exchange rate risk. Third, suppose there was indeed a run on Libra at some point in the future and the system needs a lender of last resort who can create additional Libra liquidity by granting loans. The upshot of all this is that it seems very likely that a widespread Libra adoption will sooner or later be accompanied by an infrastructure to extend loans, which are currently not part of the proposal.<sup>7</sup> Once these credit elements exist in the Libra ecosystem, though, there is space for large-scale seigniorage gains, which will accrue to Libra institutions and not national central banks. Credit elements will allow for (more) leverage in the Libra ecosystem and easier engineering of Libra derivatives, all of which raise the issue of regulatory oversight and an undermining of the current financial system. Moreover, even if there was strict regulatory oversight of these issues, history suggests that regulatory arbitrage will impair these regulatory controls, similar to the offshore Eurodollar market, which led to the formation of a global shadow banking system. Similarly, an offshore shadow Libra system could well develop in less regulated countries to provide the credit and derivative elements discussed above.

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<sup>7</sup> See, e.g., FINMA's decision to grant banking licenses to SEBA and Sygnum, which is a step in this direction in the context of existing crypto currencies. <https://www.finma.ch/en/news/2019/08/20190826-mm-kryptogwg/>.