



[Digital Democracy](#)

E-Currency

Digital Money for the Digital State

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Facebook wants to enter the financial sector in 2020 with Libra, its cryptocurrency. With its two billion users worldwide, the social media company could become a serious actor overnight, developing clout that is comparable to that of traditional central banks. Several concerns have recently been expressed around the world, although even governments are developing e-currencies of their own.

Bitcoin, Blockchain, Cryptocurrency

Blockchain, the technology upon which cryptocurrencies are based, has a great potential.¹ It offers transparency, protection, and efficiency. It can be used to reliably document all process steps and eliminate the possibility of manipulation for transactions ranging from CO₂ certificates in emissions trading, to production and distribution of commodities such as coffee. This circumvents costs for additional certification services.

In the form of money or currency, as the example of Bitcoin shows, these technical possibilities have so far not resulted in applications suitable for everyday usage. As a kind of financial investment, price volatility is too great, and, as a digital means of payment, cryptocurrencies have remained rather dubious, tending to be limited to the payment of criminal activities. Facebook's decision to invest in digital money in the form of Libra could be seen as the beginning of a new way of dealing with cryptocurrencies. The private company is not alone in developing its own digital currency. China has indicated that it will officially introduce the digital yuan in the first half of 2020, and Sweden's Riksbank is already testing the user interface for the e-krona. Facebook's announcement of Libra has also had an impact in Germany. The Association of German Banks is calling for a digital euro, and linking both Germany's and Europe's competitiveness to its successful development. This gives rise to two questions:

1. How does the innovation of digital money contribute to digital structural change?
2. What role does digital money play in the international race towards a digital state?

The Transcendence of Money

Announcing digital money as the financial system's next big innovation seems odd at first. Cashless transactions have been available as transfers, card payments, and direct debit for over fifty years. For anyone who owns a credit card, digital payment is the norm. The business model of N26, a German FinTech start-up, is reliant on mobile account management via the account holder's own smartphone. PayPal, M-Pesa, WeChat, and similar companies represent numerous private service providers for digital financial transactions. It is no news that money is no longer stored in bank vaults, instead it is coded as zeroes and ones on computer servers. But simply digitalising money does not make it digital.

Not All Digital Is Equally Digital

The financial transactions listed above are based on so-called book money or bank deposits that can be converted to cash at an ATM and withdrawn. Our digitally mapped assets reflect our expectations that banking institutions will provide us with cash. They are not a digital copy of the banknotes in question. When we make a bank transfer, we are sending a claim to cash, not the cash itself. Analogue money has various authentication characteristics, such as watermarks and serial numbers. These certify the validity of the money and guarantee its value, legitimising transactions in a secure, and uncomplicated manner. The authenticity of a 50 euro bill used to pay for a purchase can be confirmed without much technical effort. If the bill passes the test, it can be used to offset the value of the goods. Book money or bank deposits do not have these authenticating

characteristics. As such, they simply communicate a claim to money and are not themselves a digital copy of that money; for this reason, a third party must legitimise the transaction (goods for money). When an EC card is used for a purchase, the banking institution in question assumes the authentication process. It checks and confirms the liquidity for the payment transaction. In other words, financial institutions perform the function of watermarking cashless payments.

Digital money can replace this service because, just like analogue money, it is able to independently display authentication characteristics. Blockchain technology² can automatically integrate authentication into money transfers.³ As with other blockchain applications, the transactions are documented in a tamper-proof manner and require no third-party intervention, saving time and money and making even small transactions profitable. This development is expected to give rise to new business models, since digital money allows the implementation of so-called smart contracts. Such contracts provide the technology with long-term potential.⁴

Smart Contracts

Smart contracts are computer protocols that digitally map contractual conditions. They allow the transaction of automated money transfers that are subject to certain rules. Payment can be directly linked to the performance of a service without additional active confirmation by the customer. We use a comparable technology when we rent e-scooters or cars. As soon as we return the vehicle, the provider automatically makes a charge to the credit card we provided when we picked it up. Amazon's supermarkets work in a similar manner. The American online ordering service is testing the functionality of goods purchases in which the customer no longer has to pay at check-out. Instead, a software monitors which products have been taken from the shelves and automatically deducts their price from the customer's Amazon credit when they leave the store. But smart contracts also work without human action. In August 2019, Commerzbank reported successful testing

of payments between machines. During the tests, the bank transferred digital money to the system of a Daimler vehicle. The machine then paid charges autonomously after it charged up at a charging station. No human intervention was necessary.⁵

Digital money, enhanced with smart contracts using blockchain technology, allows for transactions that require no separate payment infrastructure.

The Association of German Banks considers this technology as the foundation for an innovative future monetary system. Digital money, enhanced with smart contracts using blockchain technology, allows for transactions between parties that require no separate payment infrastructure. Currently, payment still requires complex computer programmes, which only large companies with the necessary industry expertise can afford. In the long term, mid-sized companies are also expected to gain access to automated financial transactions. As soon as the technology achieves a level of user-friendliness that allows even laymen to configure automated financial transactions themselves, completely new payment and sharing models are projected to arise. That is why the Association speaks aptly of "programmable digital money".⁶

The increasing linkage of physical and virtual objects (Internet of Things) and the standardisation of data processing via intelligent algorithms (artificial intelligence) require a strategy of collaborative digitalisation. Companies and state actors must understand data as cooperative relationships, and as such translate them into services and market structures. Digital money is a part of this development, and simultaneously a vehicle of digital transformation. Moving analogue money to a digital level will add to it digital

characteristics with which we are familiar from book money or bank deposits: fast transactions and location-independent access. The decisive advantage, however, is the capability of combining money with other technologies. Blockchain technology and smart contracts will allow us to programme money according to our wishes. Digital money thus also becomes an instrument of data and process management. In view of the rapidly progressing digital structural shift, these characteristics are essential components for success. An overview of Facebook's Libra project helps to illustrate this.

New Kids on the Block(chain)

Last summer, Facebook made headlines by announcing that it was working on its own cryptocurrency. The currency is called Libra, is based on blockchain technology, and, according to the official description, is to be used as a complement to, and replacement for, classical national currencies. Akin to PayPal, Libra allows users to send money to other users in the same way they send text messages, using their smartphones or computers. There are no fees for transactions, that only take seconds. In order to use Libra as a means of payment, the user needs a digital wallet, which serves as an account for managing one's own balance. These wallets are currently being developed by Facebook's subsidiary, Calibra, as an independent application and add-on to Facebook Messenger or WhatsApp. The exchange between Libra and the national currency is performed via Calibra itself, or in the form of voucher cards.⁷ At this point, it would be reasonable to question why Facebook is developing a currency for such services, and whether digital money, as described above, is even necessary for the purpose. After all, other providers also enable global, cheap, fast financial transactions using standard local currencies.

First Come, First Served

There is a dearth of technological alternatives for Facebook's future business models. As explained above, digital money based on blockchain allows automated processes to be integrated

as an individually programmable characteristic. This makes it possible to offer extremely small transactions at low cost. A significant part of Facebook's turnover is from advertisements. Advertising providers could, for instance, make direct Libra payments for clicking, rating, or viewing advertising material, but only if the transaction is cheap and Libra's value remains stable. Transactions with bank deposits are not cost-effective for such models, and other cryptocurrencies are too volatile. But Libra is to serve as a true currency, and not merely as an object of speculation. That is why Facebook is developing Libra as a so-called stablecoin. Unlike Bitcoin and other cryptocurrencies, stablecoins are secured by bank deposits and government bonds. In the case of Libra, maintaining value is the task of the Libra Reserve, which, by collecting low-risk assets in a targeted manner, functions as a sort of savings bank. Its management is being assumed by the Libra Association, a decision-making body of actors from the private sector and multilateral organisations, founded especially for this purpose, with access to and control over details of Libra's financial situation. The Libra Association regulates Libra's distribution and assumes technical maintenance and control of the hardware.⁸

Digital money will lead to a number of new offers that do not involve long-term financial commitments for the customer.

Spotify, one of the board members, has similarities with Facebook that go beyond an analogous customer base. It is also interested in rendering services that are of little financial value profitable. Libra makes pay-per-use payment models conceivable, which would allow Spotify to add special small additional services to its portfolio. Spotify could use Libra to allow direct payments between artists and listeners based on individual titles.⁹ Another conceivable use of Libra is for mobile providers allowing access to 5G networks with temporarily enhanced bandwidth.





Just walk out: Amazon is testing the functionality of goods purchases in which the customer no longer has to pay at check-out. Source: © Lindsey Wasson, Reuters.

Digital money will not replace the current trend of billing digital services as subscriptions. However, digital money will pave the way to a number of new offers that do not involve long-term financial commitments on the part of the customer. First-mover-advantage logic applies to the development of such a product: the first into this market will gain a large market share

and a substantial lead over the competition. The integration of other business partners follows the strategy of collaborative digitalisation. The more services that can be automatically paid for with Libra, the greater its user-friendliness. Diverse potential applications are positive for wider distribution. Some of these applications will be further explored below.



Data, Money... What is the Difference?

The option of buying Libra via voucher cards, and thus with cash, expands Facebook's potential pool of customers to include those outside the structured financial sector. The company intends to systematically address regions in which population groups with low capital have little or no access to financial services. Wherever people are not publicly registered, and therefore have no bank account, Libra could spread quickly as an alternative. The financial advantages of

winning over such informal sectors as a market may seem promising, but what is significant is that in so doing Facebook is attacking the established banking system. Libra creates incentives for customers who have so far been locked out of the system. In just those countries that have weak currencies, Libra has a serious chance of becoming a second currency. The M-Pesa, developed in cooperation with Vodafone, shows the potential for success of mobile money transfer without regular bank accounts. After its introduction in Kenya in 2007, the number of active



Paying via QR code: Due to the heavily used services of WeChat and Alipay, the infrastructure for mobile money transactions is already in place. Source: © Jason Lee, Reuters.

reach of the parent company. Facebook's recent handling of personal data lacked suitable consumer protection, which is why the presence of a business interest cannot be ruled out here. Facebook's social media platform already gives it access to the private data records of people who upload details of their everyday lives. This allows Facebook to detect detailed patterns of behaviour, which are especially critical for advertisement and user content. Access to data records on individual consumption behaviour and payment will be of equal, if not greater, value.

The development of an own currency and active use of digital money provide fundamental advantages in the digital structural shift. It allows the monopolisation of financial data streams and opens up new business models, while reducing transaction costs. In Facebook's case, the customer has, to a certain extent, been paying for service with his data from the very beginning. With Libra, Facebook is putting a price tag on the data once and for all.

The Digital State: On Your Marks, Get Set...

It is not surprising that state actors see a danger in the development of Libra. Central banks are responsible for issuing currencies and are decisive in controlling the money supply in the economy. It would be economically reckless to enter into a currency competition with private actors. Moreover, there are unanswered questions regarding the modalities of state control. In congressional hearings about Libra, Facebook CEO Mark Zuckerberg was unable to name concrete measures that would ensure that Libra will operate according to standards. A task force of G7 ministries of finance and central bank governors therefore denied Libra's suitability as a functional currency.¹¹ Much like the German federal government's blockchain strategy paper,

M-Pesa users has risen to 28 million worldwide in ten years.¹⁰ The most widespread use is in central and eastern African regions, but M-Pesa is also gaining significantly in popularity in structurally weak countries such as Pakistan, Bangladesh, and Afghanistan.

Moreover, Calibra makes Facebook the only provider so far with a digital wallet for managing Libra. Even though Calibra is a subsidiary, all important communication channels within the Libra ecosystem remain within the direct

the task force does not see private e-currencies as secure, stable alternatives to state currencies. In line with this narrative, the EU finance ministers declared their intention of impairing the access of private stablecoins such as Libra to the market by means of rules and adapted regulations. An initial approach here might be to regulate Facebook according to the “same business, same risks, same rules” principle.¹² If technology companies offer financial and banking services, they should be treated as financial and banking entities. For this reason, calls for a state alternative – that is, a state e-currency – are becoming louder. A look at the international situation shows how digital money is complementing the digital state in China, Sweden, and the European Union.

In China, procedures that require identification can be transacted via the WeChat communication and payment service.

The Digital Yuan: For the People

With the turn of the year from 2019 to 2020, a new law governing the regulation of online encryption came into force in the People’s Republic of China. It gives the state authority over the standardisation of online encryption for politics and industry. This step has legally paved the way for the digital yuan.¹³ Despite the secrecy surrounding technical details and development progress, the advantages of an e-currency for the Chinese government are foreseeable.

On the one hand, there are financial factors. The central bank hopes that the digital yuan will reduce work processes in the financial sector. This would cut costs while stimulating industry. The Qianzhan Industry Research Institute estimates that this will cause the Chinese blockchain industry to grow from 67 million to 459

million yuan in the next two years. It also gives the state an instrument of control that is eminently suited to the digital revolution the country is undergoing. The digital yuan promises to give the government detailed insight into, and a better understanding of, the financial activities of its citizens. Officially, the government hopes to use the digital yuan to combat tax evasion and fraud more effectively, and to track money flows abroad in a more controlled manner. The heavily used communication and payment services of WeChat and Alipay mean that the infrastructure for mobile money transactions is already in place. The operators of these services, Tencent und Alibaba, are also considered to be close to the government and are important pillars of the Chinese digitalisation strategy. For instance, citizens have had the option of displaying their official identification documents on their smartphones via the WeChat app since 2018. This means that procedures that require identification can be transacted via WeChat.¹⁴ The digital yuan is a logical extension of this development.

The military is also planning something similar. China’s armed forces hope to manage personnel with the digital yuan. Specifically, salaries and rewards are to be linked to training performances and exceptional combat performance. Soldiers are to receive immediate feedback on their behaviour, and this conditioning via digital money will be used to continuously improve their performance.¹⁵ If implementation is successful, an expansion of the technology to China’s Social Credit System is conceivable. This would mean rewards to “good” citizens for socially compliant behaviour, and sanctions to “bad” citizens. Digital money offers the necessary technical requirements for storing data concerning individual social behaviour, and applying rules to that behaviour automatically. Fines for misbehaviour would no longer arrive by mail.

The E-krona: Driven by the People

Europe differs significantly from China not only regarding the conditions for developing digital money, but also in the motivation to do

so. Sweden still has not made a final decision about whether or not it will introduce a digital version of its national currency, but work on this is well underway. Currently, the e-krona is in a testing phase. In cooperation with Accenture, a consultancy, Sweden's central bank is analysing the application limits, legislative challenges, and possible effects on the country's economy.¹⁶ There are important questions concerning the practical design of a suitable digital environment. These concern the conditions necessary for citizens to use their smartphones, watches, and cards to pay, but also the risk scenarios in the event of a system failure. According to the Riksbank, the e-krona is intended to complement cash, but not replace it completely. However, the starting point for its possible introduction is the dwindling amount of cash payments in the country. According to a Riksbank study, such payments fell from 39 per cent to 13 per cent between 2010 and 2018.¹⁷ If this trend continues, cash will completely lose acceptance as a payment method. Scandinavia's affinity for technology is well-known. By actively renouncing cash, Swedes are forcing their own country's hand and driving the digital revolution forward.

The popularity of cash payments differs from country to country. Each country can cite different explanatory factors.

The E-euro: Europe's Opportunity

In countries such as Germany, Spain, and Italy, cash payments remain popular. According to the Deutsche Bundesbank, cash accounted for 51 per cent of all payment transactions in Germany in 2018.¹⁸ In the search for reasons for preferring cash, each country can cite different factors. The expansion of digital infrastructure, the purchasing power of various demographic groups, and the state support for digital trends influence what citizens prefer and what the market offers. Nevertheless, an electronic currency in the form

of the digital euro offers opportunities, even though those opportunities will initially be limited to European industry.

Little information is available about specific work on the digital euro, but France has already announced that it will be the first country in the eurozone to test the use of the e-euro. It helps that Christine Lagarde, the ECB's president, also appears open to the e-euro's introduction.¹⁹ In fact, with the ECB, Europe already has an international institution that can efficiently implement regulatory requirements. This includes functioning financial oversight, data protection, and legal conformity for the e-euro. Moreover, in the political arena, gains in efficiency via digital money, especially for cross-border payment transactions, are well-known. That is the verdict of the G7 working group on stablecoins, which met in Tokyo in 2019. From the industry's point of view, this means that important conditions have been met for integrating the pan-European payment infrastructure actively into the digital structural shift. The decisive buzzword here is Industry 4.0.

As international competition becomes increasingly platform-oriented, the simplicity and user-friendliness of payment methods is becoming more and more crucial. The business-to-consumer (B2C) market (digital platforms for end users) is largely developed, especially by Silicon Valley companies. Competition for cooperation among companies (business-to-business, or B2B), on the other hand, is largely open. Digital money could be the ideal instrument for networking people, machines, and products. The structural framework conditions for cooperation among market participants has long been in place and in use in the European single market. Digital money offers an innovative solution for optimising existing value-added chains and creating new ones. In freight transport logistics, the e-euro could drive huge cost reductions, and significantly enhance European business relationships. Applications in European traffic and public transport are also conceivable. The European Union offers sufficient approaches to integrating the e-euro effectively into its financial

and political architecture. The industry is aware of the opportunities the e-euro offers for the digital shift and is prepared to take on the tasks associated with that shift. Policymakers should follow suit.

Conclusion

Digital money frees users from a hitherto necessary dependence on third parties, which primarily guarantees general protection during transactions. These parties will be replaced by technology, opening up new possibilities. Depending on the application, those possibilities will have far-reaching effects on citizens, industry, and the state. Two advantages of digital money over book money or bank deposits are decisive:

1. The existing infrastructure for commerce in the digital space will be simplified. This reduces the costs associated with commerce, closes the distance between transacting parties, and creates new space for innovation.
2. Digital money allows the combination of new technologies (blockchain and smart contracts) to be accessed by all, not only those with exclusive specialist expertise.

From global players to mid-sized companies to private individuals, all actors can and should participate in, and benefit from, progress. For the digital structural shift, this progress consists primarily of the capabilities resulting from combining selective functions, characteristics, and automatisms with the use of digital money. This combination will provide the market with new business models that were previously either too expensive or unfeasible with conventional financial transactions involving book money and bank deposits. Digital money creates the foundation for new competition, which will be of special benefit to collaborative business ideas. The capability of programming money according to one's own individual business model not only fits in well with the development of the digital structural shift to date, but also drives it forward in the long term.

In the hands of a private company with global reach and billions of customers, such a currency will give rise to spheres of influence that constitute dangers that even sovereign states view as threats. In the case of Facebook's Libra e-currency, this is likely due to the fact that the currency competition is usually carried out among states. But especially in regions where state structures impair the access of certain groups of the population to financial services, digital money allows private actors to offer alternatives. This is a decisive point. The actor providing the technology will have a significant impact on the design of the individual's digital environment.

In the case of the digital yuan, controlling and educational measures are not unusual for China's digital transformation. But these measures also show that the path to a digital state cannot always be clearly separated from the path to a digital autocracy. In contrast, the development of the e-krona shows that the introduction of digital money can be seen as a natural process and a reflection of a country's culture. An important component of a digital democracy is the state offering its citizens the opportunity to become one. And this is where the calls for an e-euro come in. This is less a defensive reaction to Libra than an appeal. Europe must become a unified actor in this competition while it is still in its infancy. By introducing the euro, Europeans have already proven that the function of money is more important than its form. Why should that be different with the e-euro?

-translated from German-

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