FINANCIAL REVOLUTION ON THE HORIZON

How digital networking, blockchain and connectivity are creating billions of new customers and a fresh financial market

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The Deutsche Nationalbibliothek
Lists this publication in the Deutsche Nationalbibliographie; detailed bibliographic information is available online at http://d-nb.de.

1st Edition 2019

Nymphenburger Straße 86
D-80636 München
Tel.: 089 651285-0
Fax: 089 652096

Editing: The NAGA Group AG
Proofreading: Silvia Kinkel
Composition: The NAGA Group AG
Typesetting: Satzwerk Huber, Germering
Printing House: Florjancic Tisk d.o.o., Slovenia
Printed in the EU

ISBN Print 978-3-95972-218-6
ISBN E-Book (PDF) 978-3-96092-405-0
ISBN E-Book (EPUB, Mobi) 978-3-96092-406-7

Further informations are available at

www.finanzbuchverlag.de

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Introductory remarks

Excessive costs, cumbersome processes, false incentives and above all: more isolated solutions for specific lines of business. An old-school financial system with methods and processes from yesteryear still shapes banking, transaction and investment today. Indeed, our entire life and society in almost all areas, especially administrative, state and public sector areas, is based on such archaic processes. However, the financial sector is a particularly blatant example: billions of people aren't even represented there. Almost one third of the global adult population has no bank account and is thus excluded from payments, insurance, loans or investment products, however small they may be. Banks, our currencies (the infamous fiat money) and common payment methods do not seem to be sustainable. They do not respond to the needs of many customers, nor to the challenges of the times in all areas, such as social affairs, education, healthcare, general interest services or development aid. The historical balance of traditional currencies and systems is also devastating.

Politically and socially, in these essential areas of life and politics, we are therefore drifting aimlessly, uncontrolledly and inefficiently into the future. But the groundbreaking solutions

have long been there: digitalisation with its core elements Internet, mobile and blockchain characterise the developments that find their apparently most important expression in cryptocurrencies. In contrast to what has been presented so far, the revolutionary thing about cryptocurrencies is not the pure payment process, but the technology behind it, the more efficient processes, the elimination of paid middlemen, and above all the decentralized character and interconnectedness. In general, the secret to the success of future financial technologies and applications is precisely this interconnectedness: the linking of devices, data, completely different products, services and platforms, currencies and payment options. In particular, however, the billion-dollar population groups that have so far been excluded can be integrated into a global financial system. Although they are already resorting to alternatives today, they lack convergence.

The world is therefore waiting for a transparent financial platform for global exchange. We call it *Utopicash*. This fundamental inclusion means nothing less than the democratisation of the financial system, indeed of the entire social system, with breathtaking prospects: namely, the potential for the just integration of all people. It is a utopia, but many rules and procedures are based on principles that we describe in this book—and it provides solutions that are bitterly needed by the changing economy and society.

This financial revolution with completely new currency and money mechanisms will have drastic effects on the entire society of the future—banking and finance are only partial areas. Therefore, the thread running through this book is far more a heavy, braided rope: namely, what these changes have for social, economic and political consequences. What happens when suddenly everything, really everything, is organized in block-

chains—for example through "global, decentralized and self-determined management systems" and open applications? All this and the possible driving forces and actors of the coming financial revolution will be presented in this book, which we explicitly understand as a positive outlook.

At the same time, the completely new, blockchain-based foundations of our coexistence and operations are unleashing forces that have so far been useless, inefficient, and fruitlessly tied up in often technocratic working environments. The bottom line is that there will be differentiated ways of management and taxation—with reduced administrative effort. And incidentally: earlier excesses in the financial markets could also be a thing of the past with these new rules.

1. STATUS QUO

An antiquated financial system

Wherever we look, actors, organizations and elements of the financial system are put to the test: there is less and less faith in the hard value of currencies—and often rightly so, because they are unsecured and have often proved in the past that they are nothing more than printed paper. Banks appear to be a phase-out model. Many means of payment are expensive, restrictive and impractical. It is a story of endless failure with fragmented, isolated and incompatible solutions for the sector. When it comes to corporate control and audit systems, we are truly back in the Stone Age. All these inadequacies, adversities and the current state of the respective sub-areas are dealt with in this chapter—as well as freshly emerged solutions and new players who now have a strong influence on the financial market.

Above all, there is the fundamental transformation of our economy, the creative disruption/destruction in many industries, the (shifting and changing) needs of customers, as well as the great opportunities that new technologies bring—to offer customers new and better and often even their first-ever financial products. The revolution is in full swing: 25 years after the triumph of the Internet and laptops, mobile devices, technolo-

gies and methods are enabling the digital revolution. With FinTechs, a completely new industry has emerged, a mixture of finance company and high-tech that is strongly data-driven.

And when means of payment and currencies reach their limits—then people look for something new. We will also examine these alternatives, some of which have now become established. They have their charm and their advantages. But also flaws which is why even they are only a new building block that feeds its justification from the deficits of others, rather than a path to an overall solution.

So who are the major players on the market, and what are the major innovations? Why is all this happening now and not already with Internet 2.0? We will present the context, the drivers, the actors, the political and economic framework conditions of the current situation in a comprehensive stocktaking before we go into more detail on the individual solutions in the following chapter.

Banks as discontinued models—at least as we know them today

The counter clerk used to be an honourable citizen—and the position above all a sought-after profession. The changing of guard probably started with the introduction of ATMs. It has gradually come to replace the respected cashier. We have been doing our banking ourselves for a long time, from the computer, or they have become automated by means of direct debiting and standing orders. The counter hall with its bank statement printer seems like a relic from days of yore—and is therefore no longer as venerable as it was 100 years ago, but often looks like the photocopier nook in any given company. At the most, before

travelling abroad, one withdrew a few hundred dollars at the branch, or €10,000 to buy a used car—but thanks to other payment methods, this is now a thing of the past. And now there are robo-advisors, which replace investment advisors.

Nevertheless, banks, and with them online banks and financial service providers of all kinds, were able to defend their business model for a long time. Until now. Today, tens of thousands of young companies, the FinTechs, are attacking the business models of the established order with their apps and applications. Programmers, engineers, technology freaks and marketing experts seem to have all but replaced the bank clerk. Digitalisation is laying the foundations for this, and the revenue models continue to come under pressure, especially as the new virtual institutes have a different cost structure. And, of course, they only are picking out a few pieces of the whole picture for now; there are really no equivalents to universal banks. The focus is often on accounts, payment transactions and investments.

For financial institutions, the central question is therefore: "What else do we earn money from?" The answers are crushing:

- Loans: much too cheap and only worthwhile in the order of magnitudes
- Investment products: function with difficulty; are under extreme margin pressure and have hardly any unique selling points
- Higher fees: hardly enforceable
- Insurances: also offered by others
- Real estate agencies: high competition, but definitely an area with potential
- Investment banking: a key income component, but struggling with increasing regulation

A reason for the tense situation and the tightening of the cost screw is the large number of players, especially in Germany with its state-funded savings banks. In addition, there is the increasing fragmentation—whereby we see the exact opposite of the future of the financial sector. Banking expert André Bajorat says: "In fact, today there are only a few people left who have all the classic banking services at one bank. This development has become more dynamic with the Internet: it was easy to outsource loans, construction financing and investments to second or third-party providers, depending on who had the best conditions. Suddenly they had a credit card from another provider and a PayPal account."[1]

The number of visits to branches—and thus the number of branches themselves—has fallen dramatically. While in the past the branches of all the major institutes used to be in close proximity to one another in the most important shopping streets, their number has shrunk, first through mergers, and now through the simple fact that they are hardly needed anymore. Drugstore chains, clothing stores and mobile phone shops have taken over. At the same time, they drag themselves around with tens of thousands of staff on site and at headquarters. So you don't have to be a financial specialist to ask yourself: How is all this going to work? Are they still needed? Do banks have any future at all? The drama has increased in recent years, especially as coping with the financial crisis has distracted people from turning things around in time and tapping new sources of revenue.

Kai Pfirsich, a banking specialist, speaking of the German market, says clearly: "In the future, work in a bank, including customer contact, will only be partly done by people, so we must not be under any illusions. In the case of private banks, the ef-

fect will not be quite as great, but in the case of universal banks, around 40 per cent of employees work in customer contact, of which possibly only half will be left." Pfirsich says not a stone has been left standing: robots "can analyse, make forecasts and develop scenarios.... Artificial intelligence can also reveal the legal consequences of investment decisions, identify anomalies and cluster risks and propose solutions.... Chatbots can already make simple investment decisions today. Robo-advisors are becoming more complex; they can take tax issues into account or reallocate investments so that they are less risky as investors approach retirement age."[2] Robo-advisors automate investment and asset management. Once an investor has entered all the necessary personal and financial data, an algorithm takes over the selection and control of the portfolio—and costs only around one per cent of the investment amount in fee. Billions of dollars are already being managed through robo-advisors in Germany alone, an increase of $88 billion in just two years. The consulting firm Deloitte reports of market estimates for 2020 of $2.2 trillion to $3.7 trillion.[3]

But all is not lost yet. In this section, we will describe not only the devastating figures and developments, but also the solutions and strengths of banks. First of all, banks have an enormous customer base as assets—which is part of the problem at the same time. This is due to the fact that many customers only incur costs and do not pay off. Deutsche Bank and Postbank (which was merged into Deutsche Bank in 2012) have a whopping 20 million customers, about half of whom carry out banking transactions digitally.[4] This means that—at least technically speaking—the bank has almost daily contact with its customers, depending on their personal behaviour. This wealth can and must be a starting point to get revenue-related business going

again. One possibility would be to see oneself increasingly as a marketplace where customers can also purchase and use products from other suppliers. To explore all this, Deutsche Bank has entered into a research partnership with the renowned MIT, where experts in the "Initiative on the Digital Economy" are working on new business models and exploring "how people and businesses will work, interact, and grow in an era of profound digital transformation".[5]

Moreover, as we shall see, banks are also increasingly participating in FinTech companies. This is mainly due to the experience that the corporate culture of established corporations alone often makes innovation from within impossible.

97 per cent of all Germans have an account. The remaining three per cent do as well, but in these cases, the account of the partner/spouse is used; in the UK, at 98.9 per cent, almost all are account-holders, as in the US, with a figure of 95 per cent. The wealth that banks have in the form of their customers is therefore also a huge treasure trove of data: almost everything you can afford in the way of larger purchases goes through your account. We will come to cash later, cash being number one in some countries, most notably Germany, in terms of the number of transactions. But when the chips are down, i.e. for €50 or more, banks are back on board with their giro and credit cards, standing orders, bank transfers and direct debits. In this way, they know how much you pay for rent and petrol, that you like shopping at airports, that you repay your uncle a loan of €100 a month, which streaming service you prefer and that you have apparently become a real estate owner, because recently every month a large instalment is due and payable to the mortgage bank (unfortunately not to that of your own house). The latter example thus also stands for large or outstanding positions that

indicate important stages in life—and are therefore not insignificant for providers of financial products.

Banks know a great deal about their customers. The main payment flows—provided they are not cash or alternative channels—cross their desks. But they haven't yet done anything decent with all this data, even though they depict the entire financial life of every person, cash purchases in supermarkets, the occasional coffee and evening pub visits aside. All these expenses could be optimised to a great degree, above all for the benefit of the customers—and thus mediated and sold, even on very specific occasions. Anyone who has bought a house or just arranged for an expensive wedding has entered a new phase of life—which should also be backed or secured by special financial products. Banks could score here. User behaviour and time spent on the application is a key factor in assessment at FinTech companies. For example, ten minutes a day on the provider's app is equivalent to several hours' worth of insights from individual "bank consultancy"—every single month. This leads to meticulous insights from the field of search engine optimisation via user behaviours, such as the length of stay on subpages or clicking away from the page because information was too irrelevant or boring. Such returns are impossible to achieve through physical counselling.

Deutsche Bank, which has been in a deep crisis for years, is trying to break new ground. Markus Pertlwieser, Digital Head of Private and Business Customers, sums up the situation for his company and a possible way out: "The classic revenue models are working less and less, the number of branch visits continues to decline. At the same time, in the digital sphere, many offers are becoming more quickly interchangeable, because the next offer is usually just a click away. The position of an aggregator

who bundles all these offers and has a direct customer relationship—that is what will pay off in the future."[6] Deutsche Bank has taken up the marketplace concept in order to no longer cater for its own platform alone. Pertlwieser continues: "He who owns the rack is strategically better positioned. And that's why we're building a rack."[7] The challenge, however, is this: there must also be suppliers who want to fill this rack.

Francisco Gonzáles, Head of Banco Bilbao Vizcaya Argentaria (BBVA), the second-largest bank in Spain, goes even further in his outlook for the future of his bank: "At the end of the day, we will no longer be a bank, but a digital company.[8] Anyone who hears the word "digital company" should hear alarm bells ringing. The term shows where the journey is headed, where the main driver of development lies—and what the great danger for established financial institutions is. Just as a digital company today buys books, downloads music or uses a navigation service (namely Amazon, Apple or Google), so could the entire banking process also be handled by a digital company—since the core issues are no longer currencies, transfers or the availability of cash, but a great user experience, efficient technologies, algorithms, low costs, analysis of data, networking and all the corresponding infrastructure, such as large storage and computer capacities. Just as no bookstore, record store or traditional supplier of map material has won the race in the aforementioned sectors, so could things turn out for banks in their own field: either a digital company will come—or they themselves will become one.

It is hardly a good thing that the predecessor of the current Deutsche Bank boss Christian Sewing, John Cryan, only described the IT systems of his own bank as "lousy" in May 2016.[9] Kim Hammonds, then Head of IT, went one better: the compa-

ny was the "most dysfunctional company" she had ever worked for, she said at an executive conference. At the same time, under her leadership, having been in charge since 2013, the number of IT systems had been reduced from 45 to 32. As a target, she stated four as the number. Before she could tackle this ambitious mark, however, the American was replaced in April 2018—even after being promoted to the four-member Executive Board as Chief Operating Officer in 2016.[10]

In order to give a fair view of the state of affairs, it must be added in banks' defence that they have, i.e. have "inherited" a "tech legacy", these usually being outdated systems, whereas FinTechs can make a fresh start from square one. In contrast to the construction process of many a new building, the renovation of an old building is invariably expensive, elaborate, complex, risky and lengthy. As mundane as such an aspect sounds—software/IT is the backbone of financial firms; therefore, it is crucial. It is not for nothing that the management consultancy EY has identified this factor as one of the distinguishing features in the study *Technology disruption and the future of wholesale banking*—where FinTechs are therefore ahead and conversely traditional banks are weak. Other "minuses" include:

- The ability to drive innovation
- Less pressure from regulation
- Agility and speed in going to market
- Technological expertise
- Ability to improve existing products[11]

So nobody can say from today's standpoint whether banks will be in the lead in the complete restructuring of the industry, or renowned online big names, up-and-coming FinTechs or even

online comparison platforms that have grown to great popularity with their electricity and petrol price comparisons, and now also broker loans, insurance and financial investments. What is decisive, however, is Francisco Gonzáles's remark about the BBVA: the company will probably only call itself "bank" by name. It has been clear for a number of years how much the borders are blurring: the comparison portal Verivox has bought FinTech Outbank, Google now also offers Google Pay, and gains access to customers via credit card companies and the card-issuing bank. The established online giants and retailers in particular use their market power. Because they also have a huge customer base, they have as a result direct access to the end consumer—but communicate with them in a quite different manner, which we will examine in a moment. Rakuten, Japan's largest online merchant, offers credit cards, financial products, mortgages and securities trading. Ant Financial, a subsidiary of Chinese online giant Alibaba, has a whopping 500 million customers in China and over 100 million more in other Asian countries. Ant accounts for 51 per cent of the $11 trillion of annual online transactions in China, 16 times as much as PayPal.[12] The Ant Financial Services Group has achieved a market power that even the "Committee on Foreign Investment in the United States" found to be excessive. Ant was preparing to buy the American money transfer specialist Moneygram (347,000 agencies in 200 countries) for $800 million, but the committee overruled.

And what does the world's largest online retailer do? Amazon is not at all a retailer, but an IT company with hundreds of millions of customers, billions of data, IT and data specialists and, incidentally, a cash cow called Amazon Web Services (AWS), one of the world's largest cloud computing providers, which is itself

used by competitor Netflix. It is easy for Amazon to expand its business portfolio, which has now moved a considerable distance away from books, to include banking. Because Amazon, thanks to its sophisticated algorithms, often knows what its customers want before they do, it is world champion in the evaluation of consumer data (and exclusively for its own purposes) and knows how to constantly expand its range, especially since all the prerequisites we have already presented for the bank of tomorrow are in place here: IT personnel, IT infrastructure, and even the company's own end devices are all at hand, and transactions are constantly at stake, not to mention the customer base of millions with almost daily customer contact. Amazon has had its own credit card for quite a while, Amazon Pay is a payment service and Amazon Lending already extends loans to small businesses. Soon there will also be a current account, in cooperation with a US bank.[13] Amazon, and other online big names, have so far repeatedly managed to enter completely new fields themselves, such as the production and screening of films—money transactions would not even be far away from online purchases, and very close to consumers.

The decisive factor during the war is therefore customer contact—but also data. This is where API comes into play: *APIs*, Application Programming Interfaces, are digital programming interfaces through which data is made available and combined with other data. This makes completely new financial services possible. Most as well as the key transaction and money data is still in the hands of banks. And the insights gained through API can be used to generate new services and business. In our eyes, API is another technological keyword—and at the same time the basis for opening such important platforms that need to be accessible in any case. Deutsche Bank has therefore also set up a 35-person

API team. Its director, Joris Hensen, says of his wealth of data: "In contrast to information that large Internet giants have, payment data is much more meaningful, because it is based on reliable facts."[14]

However, as of September 2019, all institutions in the EU will have to offer some of this data via interfaces within the framework of the EU Directive PSD2 (Payment Service Directive). PSD2 requires, for example, that transaction data be made available for the preceding six months. Of course, six months does not give an overview of the entire year, especially since, as is generally known, many payments are only due on an annual basis. Deutsche Bank would also like to have access to the annual transaction list paid for by any cooperation partners.[15] It is a question of balance. As shown, open access and cooperation are sorely necessary in order to be broadly positioned, to receive suggestions and developments from all sides and to offer a wealth of different financial products and solutions—an open system that has long since worked in other industries. API boss Hensen of Deutsche Bank says: "For a platform to grow and benefit from network effects, it is important that access for all parties involved is as smooth as possible.... Every obstacle that could prevent someone from registering must be removed."[16] Here, the Payment Services Directive facilitates matters for many FinTechs. They can benefit from banks' open access commitment to third-party providers. From a technical point of view, the aforementioned API interfaces provide access to customers' account information. One need not be a proven expert to recognise that this arrangement means the loss of an important competitive advantage for banks. Resourceful FinTechs will process the data and cobble together cheap, modern offerings from it. At the same time, however, PSD2 also covers FinTechs, provided

that they offer account information and payment initiation services, for example. They will have to expect an increase in operational costs.[17]

The fact that Deutsche Bank's IT, or at least its IT strategy, no longer looks quite so lousy is shown by another project in which Deutsche Bank has taken the lead. Under the leadership of the financial institution, a large consortium including Allianz, Daimler, Lufthansa, Deutsche Bahn, Axel Springer and many other German business leaders is working to find a solution for the fact that many Internet users use their Facebook or Google identity when logging in to a new online retailer or other application—so as not to have to create a new account every time. However, the data also makes its way to the headquarters in California via these single sign-ons (SSO). With Verimi, the assembled strength of the German economy is now trying to counter this with a European solution, also against the background of the General Data Protection Regulation (DSGVO) introduced in May 2018. Typically for this scene, a start-up was set up in the bohemian Berlin district Kreuzberg, but in the offices of the Bundesdruckerei (Federal Printing Office), which is also on board. The advantage here—in addition to the fact that new partners who offer their products and services in this country are added every week: anyone opening an account first identifies himself to employees by video with his ID document or directly with the electronic ID card, for which various digital functions have been prepared (of course from the Bundesdruckerei). Thus, in contrast to the situation at Google and Facebook, the identity would be proven beyond doubt and Verimi could also be used as a central log-in platform for financial transactions. Banking expert Julian Grigo from the trade association Bitkom sees such a form of authentication as exciting for FinTech or

crowdfunding portals as well, "because the widespread solutions such as Facebook and Google do not meet the necessary requirements of financial regulators to open a bank account, for example".[18] However, it remains to be seen whether it is favourable that with the log-in service NetID—behind the United Internet (GMX and web.de having 33 million users), RTL and SAT.1—a second German service provider is simultaneously entering the field. In any case, there are also efforts in other major economies to break away from "American dependence", including in India, China, Japan and Australia. India, in particular, uses SSO in the public sector/e-government.

Karsten Junge, management consultant at Consileon, as quoted in the business magazine *brandeins,* sees above all "three factors for the platformisation of the financial sector: the wishes of customers, technical innovations and regulatory requirements".[19] In his opinion, it will not stop with regulation and forced openness through PSD2. "Why shouldn't there eventually be an obligation to disclose securities account or performance data via APIs? That's why any bank that's already moving in this direction will be ahead of the competition later."[20] The opening up of the systems is no small matter—not to mention the change of mentality within banks. Junge believes that today they have the same strategic importance as a decision to withdraw from investment banking or close a few hundred branches. "To be the one who has the customer contact and communicates this access to others—this will become immensely important in the coming years.... Because "no customer wants two smartphone screens full of financial apps—so a concentration will come about."[21]

But banks have to make a living from something. Kai Pfirsich has a few suggestions here as well: "The payment could run as

usual via commissions—which must be transparent. New models could also be developed: Link the price to the performance of an investment, or the client buys further products, and a mixed calculation is made with a discount on the consultation. Or the customer pays with his data, which the bank then gets, rather than Google or Facebook."[22] But here, too, the German/European regulations represent a significant disadvantage in international competition.

So while banks are coming under pressure from all sides—and not everything is their fault—there is, then, a glimmer of hope. The IT infrastructure is vast, as is the customer base. But both can also be a millstone hanging around one's neck. Many customers don't contribute anything, and IT systems can be outdated or excessive in number, especially after mergers. But there is also a special problem: the products are largely interchangeable—because little new technology is tried out.

There are primarily cultural and linguistic reasons why banks are so out of date. The entire habitus does not appeal to today's customers, especially young people. Studies show that young people are more reluctant to talk to a bank advisor than to visit a dentist. And that's just the external perception. Something is wrong on the inside as well—let's call it the *Corporate Dilemma*. For example, a manager in asset management does not care that his asset class is developing particularly well or even above average—for example, because he is creative or particularly clever. No, important is how the comparison looks with the official industry benchmark. Otherwise, despite good performance, one is asked why the competition made quite different (often similar) decisions? Even if these had a negative impact on the results of the others, one is still viewed with a suspicious eye because one failed to behave in line with the industry. For an asset manager, it

is therefore more important to follow the—possibly negative—benchmark than to generate 15 per cent profit per year for its clients.

Behind this attitude is, among other things, the fundamentally risk-averse structure of banks. Whoever takes a risk and makes a profit with it—and the amount of profit depends on the risk—is not well received. At the same time, it is okay to lose millions if you have behaved like the overall market—which is now also in the red. You don't attract talent with a policy like that.

Thinking in terms of status and professional pride also continue to play an important role. In the City of London, "Who you know" is still more important than "What you know". Nepotism has often developed within the corridors of power. People know one another because almost all families have attended the same two or three educational institutions. And the bottom line is that the entire user experience does not appeal to many customers. So if we look at the nature of the current banks—beyond the market developments and technologies that we have already described—we have a problem of habitus, generation and corporate culture. Banking specialist Pfirsich therefore believes that banks must be much more open to lateral entrants. In his opinion, the entire methodology and the way of dealing with customers must change decisively: "This requires a high level of communication competence and a very broad general education. One must be able to think oneself into different lifestyles and stages of life, to develop a feeling for the other."[23]

In addition, banks are oversleeping or are dragging their heels on innovations. This is nothing new. But why is this, exactly? It is almost impossible to get through the committees with new ideas. Their structures are often fossilised, murky, charac-

terised by arrogance and risk aversion as described and also designed to maintain the status quo. With innovations, even pioneering or risky ones, it is difficult to get through. In addition, there is a "compliance paranoia"—one hides behind sets of rules. Not *like* bureaucrats; rather, they *are* bureaucrats. So we don't misunderstand each other: rules are important and so is their observance; we have dedicated a whole section to them in a later part of this book. But increasingly growing internal regulations (in addition to legal regulations and the work of the supervisory authorities), which serve only to safeguard positions and do not serve progress, are constricting and smothering every organization. And even this does not attract top people, which in turn is why it is difficult to establish something new.

Now, one might think that it is the internal supervisory bodies of banks that serve to uncover all the weaknesses and undesirable developments and to demand that they be resolved so that the operation can stand up to competition (which is not to be found among the other banks). But here, too, the structures that elsewhere are forcing the pace of those in charge only serve the purpose of self-preservation.

The danger for one's own bank or for the entire industry—through FinTechs and new technologies, which we will discuss in the next sections—was not recognised at all until recently. But this would be sorely needed, because this is nothing to which one can react even in one or two years, after gaining an overview. For this is not about the introduction of the credit card or online banking, but rather about an extremely rapid, revolutionary, existential and disruptive development. Whoever falls behind because of oversleeping a new form of technology or having customers desert them faces hard times. They won't be impossible, as the next section will also show and this one has

shown here, but they will be expensive—and above all avoidable, if one had processes and structures that promote new developments, as is the case in other industries. It is in fact a risk-averse policy that leads to risk. The fate of Kodak and Nokia, whose core businesses were on the brink of collapse on short notice, should to be a warning to all.

In addition, the essence of current technological development has not been grasped at all. Although it is rarely possible to bring earth-shattering upheavals to a single point, one thing is certain: decentralized structures are at stake. The future belongs to them. The fundamental changes that emanate from this paradigm have not been understood by many bank managers. The basic concept, at least, has already been adopted by some.

In Germany, the number of employees in the banking sector is constantly declining. While 702,750 employees were still employed by banks in 2005, the number fell steadily to 609,100 in 2016.[24] However, this negative development cannot be confirmed in an international comparison. While employment in the US financial sector reached an all-time low of 7.6 million in February 2011, employment rose to 8 million in February 2015 and to 8.6 million in July 2018.[25] A similar development can be observed in the United Kingdom. According to the British Office for National Statistics, employment in the financial & insurance activities sector was precisely 1.17 million between January and March 2014, and 1.260 million between January and March 2018.[26] In this respect, the period between 2014 and 2018 did not see such marked growth as in the USA; nevertheless, the number of employees—in contrast to Germany—increased steadily. Within the EU, however, the number of employees in the banking sector has been constantly reduced.[27]

Credit sector employees in the EU

Year	Credit sector employees (in millions)
2009	**3.18**
2010	**3.14**
2011	**3.11**
2012	**3.05**
2013	**2.96**
2014	**2.89**
2015	**2.86**

Source: EBF (2016): Facts & Figures 2016

Parallel to the reduction in personnel, the number of branches in Germany also declined, although only slightly in the USA and Canada[28], while a minimal increase was even recorded in the United Kingdom.

Banking branches in Germany[29]

Typ	2013	2014	2015
all branches	38,225	37,293	36,005
private banks	10,440	10,251	9,986
savings banks	12,740	12,367	11,872
credit unions	12,622	12,319	11,847

Source: Deutsche Bundesbank (2017): Banken in Deutschland. Kreditinstitute und Banken.

Banking branches in the USA

	2013	2014	2015
US banking branches	82,266[30]	81,544	81,119

Source: Statista (2018): Number of FDIC-insured commercial bank branches in the United States from 2000 to 2017.

In contrast, the Royal Bank of Scotland (RBS)—one of the UK's largest banks—had to cut 54 branches in England and Wales and 258 associated jobs in September 2018. It was already the third such measure within one year. In May, 162 branches with 792 employees were closed, while last December, it was a matter of 259 branches with 680 jobs. RBS reported that transactions in its branches have declined by 30 per cent since 2014. At the same time, the number of customers using mobile banking increased by 53 per cent, while mobile transactions grew by 74 per cent.[31]

Be that as it may, disruptive changes are of course easier for those with an idea for the future who do not come up against the fossilised and cumbersome structures of a large tanker, but can start from scratch—or to be precise, they are the ones who are responsible for this disruptive change. Ideas with great business potential—and we can both tell you a thing or two about that—are difficult to put through internally at banks. The committees and voting procedures are too inflexible; therefore, it is no wonder that FinTechs were finally created as a reaction to this, causing the financial institutions to get into pretty pickle.

All these shortcomings and design flaws have already been aggravated by banks over the past decades; here, Germany is a stark example. The industry—symbolised in Germany by Deutsche Bank with a crash in stock market value from €53 billion in 2006 to €20 billion in June 2018—has been passing through a vale of tears for years, at the latest since the financial crisis. At the same time, the book value of its capital in March 2018 was €61 billion; the liquidity reserves even reached 14 times the market value, namely €279 billion. Nevertheless, analysts do not yet see the bottom of the trough and are forecasting a further descent. The reasons given are nonstop bad news and the weak operational business. For Christian Koch of DZ Bank, it was

"difficult to predict" how the bank could free itself from the "downward spiral".[32] Commerzbank has even lost 97 per cent of its former record high and now occupies only 367th place in the global bank ranking. The balance sheet total of all German banks fell by an average of almost four per cent in 2017, more than in previous years.[33] Internationally, however, the situation is more relaxed: since the crisis, the world's largest banks have significantly improved their economic situation and, above all, their equity, EY writes in its *Global Banking Outlook 2018,* as was also prescribed by the regulatory authorities.[34] Banks have bolstered their balance sheets and are looking to the future with confidence. According to the EY survey, the vast majority of bankers expect earnings and profitability to continue to grow—despite rising costs. However, most banks have to "make a significant effort to achieve sustainable long-term profitability." Pressing, problematic factors are the cost situation, the limited possibilities for revenue growth and risks such as cybersecurity." Banks simply lack the resources "to keep up with the rapid pace of technological progress," EY concludes.[35] [36]

The new technologies surrounding the decentralized blockchain could therefore make things warm for banks worldwide. In order to survive, they must therefore consider the most important points of digitalisation. The consulting firm EY has drafted important "key questions" to answer:

- Does my strategy account for rapidly changing revenue and profit pools?
- What is my role in the ecosystem and how do I innovate efficiently?
- How do I implement strategic changes in a rapidly evolving digital environment?

- How do I change my "talent" to support a more digital business?
- Am I sufficiently considering new risks and cybersecurity?
- How do I transform my technology and the organization of technology?

In these—and other—areas, banks must act to develop "scalable, digitally activated business models".[37] EY casts the circle of competitors quite far. In addition to the obvious FinTechs, the management consultancy designates "digital banks, high-touch and high-tech institutions, e-commerce and telecommunications companies, as well as platform banking providers in some markets".[38] In addition to FinTechs, there are, then, a number of other "non-banks".

No text on the difficulties and future of banks should be without Bill Gates' ingenious sentence: "Banking is necessary, banks are not." Another entrepreneur, the prominent German billionaire Carsten Maschmeyer, said in more detail in *Manager Magazin* in 2015: "We will no longer need the full-service branch, with all the usual services offered by a large bank, as a result of digitalisation. But the partial service, namely the provision of payment infrastructure, is still necessary nationwide."[39] And what about the employees? Bank expert Pfirsich says: "Quite a few will leave the bank, many will work in service departments, for example as troubleshooters for customers who are not familiar with the technology. There will be more assistance functions in the future: employees in the back office will assist the remaining consultants by researching and processing the results of the systems. In terms of specialist knowledge, only a basic stock is needed, which is why more lateral entrants will be working in

these areas. That means, of course, that the competitive pressure for trained bankers is increasing." Overall, the industry estimates that 50 per cent, possibly even 70 per cent, of jobs could be lost by 2030 in Germany alone.

FinTechs—and their relationship with banks

Banks have another advantage: they have a banking licence. In this section we will outline the FinTech success story—few of them, however, have a banking licence. Perhaps this is the biggest treasure of banks, which in turn has to do with regulation, and therefore many FinTechs work with traditional financial institutions.

With an average funding of $44 million, FinTech start-ups often initially focus on a single product. It is only after their position has solidified in a particular niche that they begin to use their brand and expand and diversify product groups.[40] FinTechs owe a large part of their success to the global financial crisis of 2008/09. Against this background, what happened in Germany in September 2018 is particularly emblematic: the FinTech (which was not so named at the time) Wirecard, founded in 1999, displaced the second largest German bank, Commerzbank, from the almighty German stock exchange DAX. What better symbol could there be for the upheavals in the financial market? A FinTech of the very first generation displaces the second largest German bank in the German stock index. Commerzbank CEO Martin Zielke had to accept it like a force of nature: "At the moment, it is simply the case that the FinTech market values FinTech higher than traditional banks." This development is spurrring Commerzbank on to press ahead with its transformation into a digital technology

company.[41] Deutsche Bank should also feel encouraged, after all, shortly before the Wirecard DAX listing, it was lagging behind Wirecard's market capitalisation by €2.5 billion. Wirecard, a payment processing service provider, was launched just under 20 years ago. The company has quadrupled its stock market value over the past two years, ripping away at Deutsche Bank's stock market value in late summer 2018. If one takes a close look at the company, it is clearly a FinTech—even if it does not run under this label and there is no uniform definition for this anyway.

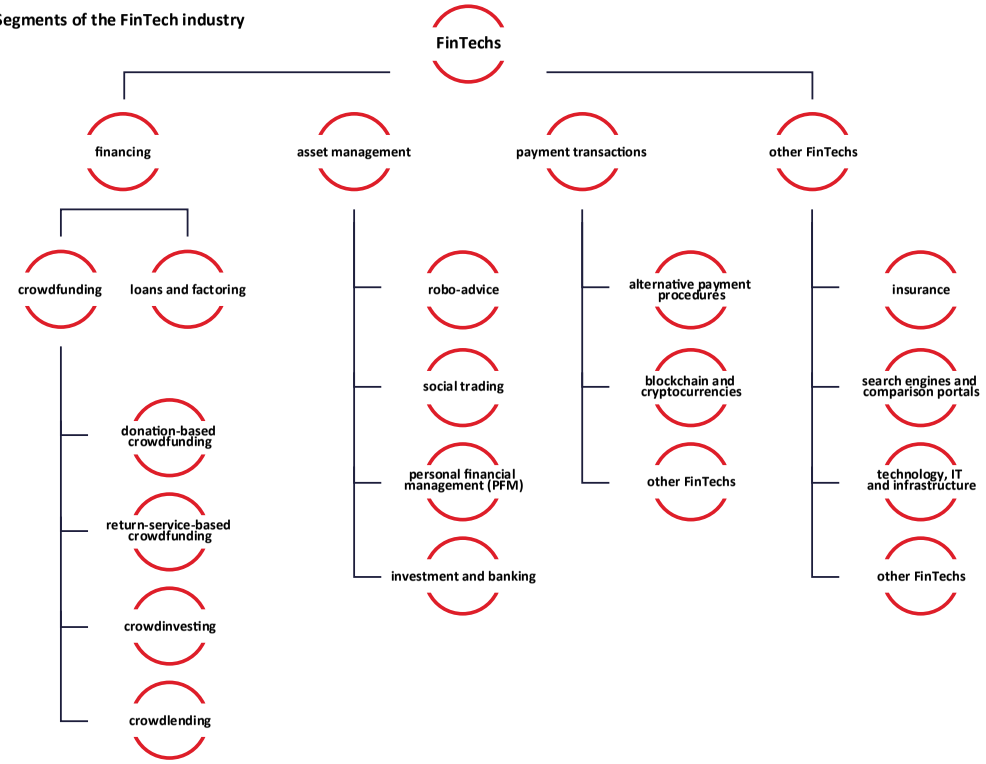
Wirecard is active in 26 countries, with more than half of its revenue generated in Asia, and with its 5,000 employees, it ensures that online payments work and that online retailers receive their money. So Wirecard deals in payment methods, doing so digitally right from the start. The coveted banking licence came in 2006. Perhaps this was even necessary, because the tight corset of regulation has a significant impact on the rate of innovation and growth. In this way, the company was able to issue its own credit cards and offer its customers comprehensive financial solutions, something only banks are otherwise allowed to do. Today, Wirecard serves, for example, DHL in Asia or the airline Qatar Airways. It additionally administers the voucher cards of Aldi and Lidl. The company also developed mobile payment long before the topic became en vogue. For many years it was rather plain fare, but the down-to-earth nature of the company and the many years of research and development are paying off. When Alibaba was looking for a partner in Europe for its payment service Alipay, Wirecard offered the solution. Three years ago, the company developed "boon", its own payment app for contactless payment at the point of sale. Markus Braun, CEO, told the daily *Die WELT* that all this was just the beginning: "There will be no more cash registers in the current sense in a few years. The

shopping experience is changing fundamentally. The actual payment process is becoming more and more a secondary matter."[42]

Technology-driven start-ups from the financial and insurance sectors are driving the capital market forward at an accelerated pace: whether credit checks, financial investments, apps for stock exchange trading or virtual goods, crowdfunding or consumer video identification as a supporting service—young companies complement and enrich the competition with innovative products and services. In some cases, they have also created completely new divisions and company classes. This is because it is not just about end customers, but also about services for the industry and back-office applications (business-to-business); those who work in the background, but without whom the system does not work. So Wirecard, cloud computing or big data applications. Others are preparing to find new solutions for the core functions of "financial intermediaries". And we don't want to forget cryptocurrencies—and the star system around them with the abundance of service providers. The most mature FinTech areas are payment transactions and lending. New fields of FinTech innovation are artificial intelligence (AI) and data analysis. FinTechs in the USA, for example, are assailing universal banks mainly in two areas, reports EY:[43]:

1. **Lending via platforms** (Marketplace Lenders, MPLs). They are making things rough for traditional lending routes, because FinTechs have lower overheads, higher transparency, approve the loans more quickly and thus achieve higher returns on capital.
2. **Blockchain-based supply chains** that will also drastically change stalled payment and credit processes. More on this later in the corresponding chapter.

Segments of the FinTech industry



Source: FinTechMarkt in Deutschland (FinTechMarkt in Germany) – Final Report 17 October 2016, Prof. Dr. Gregor Dorfleitner, Junior Prof. Dr. Lars Hornuf

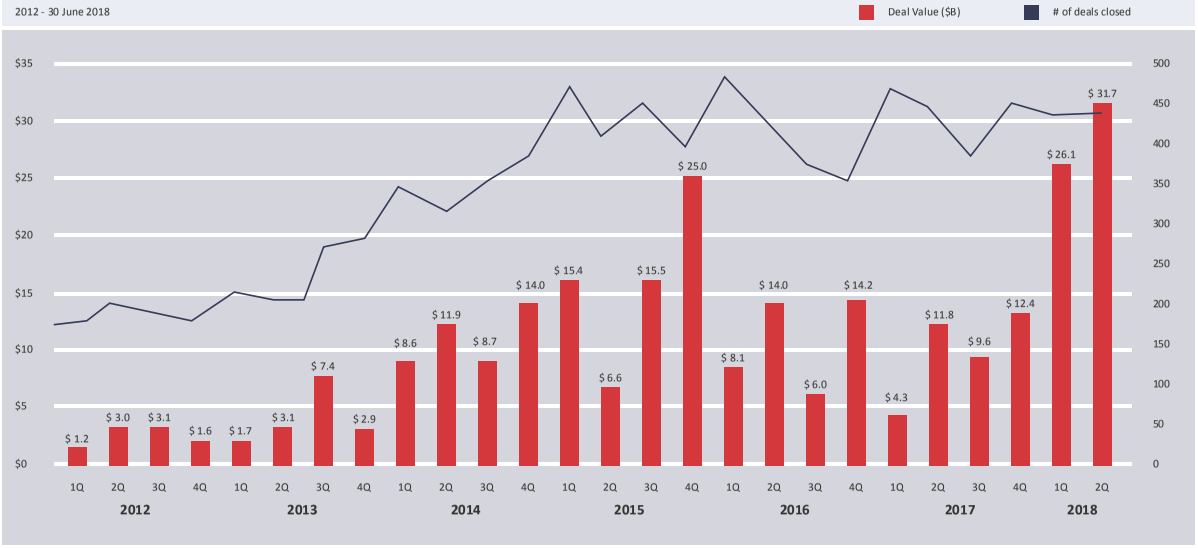
MPLs are already having strong effects on the market. Blockchain-based solutions will take a few more years to mature. However, they are then likely to strike with full force, as they cover the entire supply chain and can thus take over a large number of players who still rely on banks today.

Important FinTech hubs are located in California, New York, Massachusetts (all in the USA), London, Germany (especially Berlin, Hamburg, Frankfurt), Singapore, Hong Kong and especially China, where the companies are admittedly scattered. Global first-half investment in FinTech companies was $57.9 billion, surpassing the total of last year's earnings, according to KPMG's *The Pulse of FinTech 2018* report.[44] Some highly developed payment service providers achieved strong exits in the first and second quarters. These include successful IPOs—EVO Payments, GreenSky and Adyen—and M&A solutions from WorldPay and iZettle.[45] Investors have greatly expanded their area of interest to include, in addition to thematic sub-areas, particularly also innovative technologies such as Artificial Intelligence and Robotic Process Automation (RPA). Furthermore, there is the geographic expansion; new FinTech hubs such as Brazil, Japan, India or South Korea are growing. The outstanding example here is Brazil's Nubank, whose valuation has risen to more than $1 billion and is thus one of the "unicorns". The Asian FinTech market is dominated by China and India. In Europe, London—despite uncertainty surrounding Brexit—remains the undisputed frontrunner.

In the first half of 2018, US FinTech's investments received in excess of $14.2 billion, five billion of which were venture capital investments—this across the country, yet the focus is on California and Massachusetts. Prominent deals were spread across many sub-areas: blockchain (Circle Internet), cryptocurrencies

Global investment activity (VC, PE and M&A) in fintech companies

2012 - 30 June 2018



Source: KPMG, The Pulse of Fintech 2018 Biannual global analysis of investment in fintech, 31.07.2018

(Basis), insurtech (Lemonade, Oscar) and asset management (Robinhood).[46] At the same time, investments in FinTech companies in Europe were $26 billion, with huge acquisitions of WorldPay by Vantiv with a value of $12.8 billion, PayPal's $2.2 billion purchase of iZettle, or Nets, and IRIS Software.

The United Kingdom is ranked first in Europe with $16 billion in Europe, but there were also spectacular deals in Denmark and Sweden (Nordax Group, $788 million). Four of Europe's ten largest rounds of funding in the first six months of 2018 ultimately took place in the UK: Revolut ($250 million), eToro ($100 million), Flender ($60 million) and MoneyFarm ($54 million). In doing so, British businesses can also build on government support. In March, the first FinTech sector strategy was released, aimed at helping Britain maintain its leadership position in Europe.[47]

In Asia, investment in FinTech companies was $16.8 billion, according to KPMG. Gigantic in the course of this was Ant Financials' $14 billion funding round—which sent Asian totals soaring. In addition, China saw four more rounds of financing exceeding $100 million: Dianrong ($290 million), WeCash ($160 million), Meili Jinrong ($130 million) and Tiantian Paiche ($100 million). Large companies such as Ant Financial, Alibaba, WeChat and Tencent are striving for neighbouring markets with great force, partly because there are significant Chinese populations there.[48]

In a global context, the US industry is the largest. But Europe and Germany are in the meantime also playing a successful role. Deutsche Börse, for example, has responded in its own unique way to the challenges posed by the up-and-coming FinTechs by promoting, advising, networking, financing and participating in them in its own *FinTech hub*. At a FinTech discussion

in Berlin in 2017, Stefan Leisner of the German Stock Exchange was therefore unperturbed about the relationship to the up-and-coming companies—no wonder, given his strategy of summarily buying into the companies. Björn Albert, Head of Division at Euler Hermes, also a proponent of old-school methods, recognised a great threat at the same event. But he remains fearless: "Markets and technology are changing. The competition is so increased. That's great."

In fact, black and white thinking is not appropriate. FinTechs are able to open up new customer groups and do not always take something away from established customers. Stephan Heller, founder and CEO of Fincompare, a financing platform for small and medium-sized enterprises with a financing volume of more than €1 billion, however, perceives a clear omission on the part of his industry's traditional institutions: "Consulting is completely neglected. We, on the other hand, bring companies together with consultants. This is how we keep our customers."

It is not the FinTechs that pose the core threat, but digitalisation. At the same time, however, there is also a competitive disadvantage for the established order with the excessive regulatory system—to which the FinTechs often do not have to adhere. This, too, is an aspect that is literally forcing cooperation: where regulation is in place, FinTechs prefer to cooperate with traditional companies. For almost two years we have been observing how the fronts between the two sides have broken open and how the current market reflects a "both-this-and-that" rather than an "either-or" position. Of course, all this does not happen by itself, but only through the emergence of competition.

And we must not forget that none of this is self-sufficient. FinTechs are considered innovative, fast and unconventional. But at the same time many young companies fail. Not all busi-

ness models work. The aforementioned former AWD managing director Carsten Maschmeyer, who himself holds shares in Fintech barzahlen.de, already had an unsentimental view of the future of the FinTech industry in 2015, assuming that only about every tenth company would survive in the long term.[49] It did not turn out quite as badly as this, and Maschmeyer's investment object is also still in existence.

In the meantime, the market has clearly consolidated and matured. Investors tend to concentrate on older companies whose business models have already proven their worth. After all, proven technologies from one market can be used and scaled profitably relatively quickly in other countries. In the meantime, the former newcomers have to take care that they don't soon belong to the "established" guard themselves. Berlin banking shooting star N26—valued at $750 million in April 2018—is among the numerous purveyors who have unceremoniously joined forces to form collaborations.

N26 is one of the numerous representatives who have quickly formed cooperations. Not without risk for the partners in question. It almost seems as if it is method of the Chinese, who two decades ago joined forces with Western companies in mixed companies—to siphon off knowledge and possibly go it alone later. Bank expert André Bajorat comments: "N26, for example, has done things in a clever way. They collaborate with other providers to offer their customers services such as insurance, investments, foreign payments or loans, and take their time to see which services work. Sooner or later, they'll construct them themselves."[50]

Unicorns are found elsewhere in great numbers. As in other technology areas, FinTechs were first developed in the USA; later, other countries followed suit. Whether InsureTech, Financ-

ing, PropTech or Payment—FinTech start-ups have shocked and caused change in smug banks in recent years. They have broken up fossilised structures and pushed for change. No wonder, then, that the high-tech top dogs are also playing a part in this area. As KPMG writes in its report: "In the US, we are seeing companies like Amazon, Microsoft and Google in an arms race—they have all hired top executives to drive expansion in this area, and are actively recruiting FinTechs on their cloud platforms."[51]

And how have the industry giants and the world of high finance reacted to all this? They have long since woken up and have now founded their own development departments, entered into cooperations or bought up start-ups without hesitation. In addition, they have opened incubators and hubs, for example in Germany the aforementioned Deutsche Börse and Deutsche Bank with its Digitalfabrik (Digital Factory). The agency Neugelb from Commerzbank, now descended from the ranks of the DAX, is to close the digitalisation gap there.[52] Established enterprises will therefore not be swept off the market so quickly. Rather, there will be cooperation and coexistence between the two groups. The Deutsche Bundesbank says: "Positive effects can result if innovation, efficiency and transparency are increased, costs reduced, markets completed and risks more strongly diversified. Thus, the market entry of new providers boosts competition in the financial system.... Even established players are forced to become more innovative in such cases. In particular, the increased automation associated with FinTechs can lead to increased efficiency and lower search and transaction costs."[53] Driven by FinTechs, banks are changing and becoming more innovative—even if they find it difficult. That is because this only works with huge investments, for example in

IT. Possible responses to the strong emergence of FinTechs, which we have already mentioned, are summarised by EY in four bank strategies:

1. Innovation/improvements in digital transformation
2. Acquisition of companies/partnerships
3. The creation of incubators
4. Awarding venture capital.

The last three points all have the obvious aim of making it easier to access innovation. Opting for one solution or another depends on how much time and money one wants to invest.[54]

With Creditshelf—a pioneer in lending to small and medium-sized enterprises via online marketplaces—another FinTech went public in Germany this summer. The company reported proceeds of €16.5 million from the issue of 20 per cent of its shares. Tim Thabe, CEO and co-founder of Creditshelf, says: "We see that the demand for our products is constantly increasing. With the proceeds from the capital increase, we want to take account of the dynamic growth of our business." And this "dynamic growth" is impressive: in the first quarter of 2018, the company received credit applications for more than €251 million, compared with just €66 million a year earlier, or just under a quarter. But there is still room for improvement. According to Daniel Bartsch, Chief Operating Officer and co-founder of Creditshelf, the "hardly penetrated market" for small and medium-sized enterprises in Germany has a potential of a whopping €39 billion. Creditshelf would like to get a piece of this pie, but is modest: loans exceeding €500 million are said to be brokered annually via the platform. This magnitude is to be achieved by the essential nature of FinTechs—the all-decisive new technolo-

gy. According to its own statement, the company has "extensive know-how in the field of automated and data-driven credit analysis". And this analysis is to be made even more precise and efficient with the proceeds from the IPO in order to further reduce process costs.

As if placed under a magnifying glass, Creditshelf shows the drivers and effects of the FinTech revolution: the money flows to a large extent into research and development—in this case a data-driven risk analysis algorithm. As a result, the product portfolio is expanded and the company then seeks to enter into cooperations with banks. This shows that it is not possible without experienced market participants.

What works superbly within the financial sector, i.e. in the B2B sector, does not work that well in relation to end users: only 8.5 per cent of German companies integrate FinTechs as potential partners as a result of the digitisation of their financial processes, according to the consulting firm Syracom's study *FinTechs in Corporate Banking*.[55] The number one address when companies digitise their financial processes is therefore traditional software institutions. Banks are mentioned much less frequently when it comes to solution providers for digitisation projects. "Other service providers" follow, and not even one in ten thinks of FinTechs.

What are the current trends in the FinTech sector? There are quite a few, but we'll pick a few to represent them. What most people have in common is that they can do without banks. First of all, the crowd-investing (a.k.a. equity crowdfunding) method is proving to be a successful concept, especially for medium-sized companies. The decisive advantage here is that the process should be cheaper, more efficient and more user-friendly compared to lending by banks. An outstanding player is the FinTech company

Finnest from Austria, which specialises in medium-sized businesses. Another important FinTech segment is concerned with the real estate sector.

A further innovation for the FinTech industry comes from the United Kingdom. In spring 2018, *Transferwise,* a FinTech without official bank status, was integrated into the UK payment system. This is another example of how the services of banks are becoming obsolete. Transferwise does not require a bank to transfer the funds, and the services are faster and cheaper.[56]

In addition, fully automated payment methods will increase globally. This means, for example, that invoices should be processed passively and without permanent confirmations. Another important development is the Initial Coin Offerings (ICO), i.e. the issuing of a cryptocurrency by a FinTech. The term is based on Initial Public Offering (IPO), which already indicates that this is essentially about financing start-ups. The tokens issued are therefore an instrument for raising capital and benefit from lower regulatory hurdles. This makes an ICO particularly attractive for young companies to finance projects, and tokens are more likely to compete with venture capital funds and seed capital. In direct comparison with venture capital companies, more money was already generated by ICOs in 2017.[57] NAGA, our company and a publicly traded Fintech specialising in financial markets, virtual goods and cryptocurrency trading, has also gone the same way with the NAGA COIN. This holds true to an even greater extent when it comes to cryptocurrencies.

Finally, blockchain networks are proving to be one of the most important pillars of the FinTech industry, which is also dealt with in a separate chapter. According to Fundresearch, there is another trend that has affected the FinTech industry: since 2011, more and more account holders have been using their smart-

phones to conduct banking transactions. The proportion of mobile banking users using smartphones increased by around ten per cent between 2011 and 2015.[58] Expert André Bajorat comments: "Like direct banks 15 years ago, smartphone banks will build a substantial business, but not completely destroy the traditional banks."[59]

However, the regulatory burden is increasing—in Europe, for example, through the General Data Protection Regulation, the Payment Services Directive and the Markets in Financial Instruments Directive (MiFID II)—and thus also costs and expenses. This is an enormous cost, especially for globally active companies, as they simultaneously have to comply with regulations and requirements in different countries. The inevitable management of regulatory requirements and compliance issues has for some time produced its own FinTech sector, which has also attracted heavy investment: RegTechs, such as CloudPay in the UK or Harbor Compliance in the USA. These are tech companies that simplify and optimise compliance and reporting for FinTechs, and also protect against fraud by employees and customers. Many of these companies operate on a platform basis.[60] RegTechs are thus a further and generally speaking new growth area.

The global FinTech market, on the other hand, will continue to grow thematically, geographically and technologically, not only in the most developed markets of "payment services" and "loans". Add to that the aforementioned InsureTech and RegTech and investments in technologies such as AI, RPA and blockchain.

Interim conclusion

The financial market is already unrecognisable today—and it will be all the more unrecognisable in ten years' time. We have outlined the main guidelines: as in all areas, the customer (business and private) sets the pace with their needs. They want it comfortable, cheap and without delay—and preferably, they want to have the choice. FinTechs offer the better solutions here, and banks that are surviving are becoming more or less FinTechs. It will be important to reunite all the fragmented services. The threat from the new market players will continue. In their study, EY's advisors brutally proclaim: "Those who only respond to today's challenges do not adequately anticipate the factors of destruction of tomorrow."[61] From the point of view of banks—as we know them today—and their employees, it will be bitter. Many of them will have to look around for other jobs—which, however, are being created elsewhere, not least by up-and-coming, hungry young companies. However, banks and the many other traditional financial intermediaries cannot be completely written off. As the EY report concludes: "Although FinTech start-ups and non-bank players have triggered the current wave of innovation, traditional universal banks still have immense opportunities. By building services for existing customers and leveraging their vast industry knowledge, regulatory expertise and market presence, today's traditional banks can reshape the industry."[62]

So the traditional financial institutions are still holding some trump cards in their hands. They just need to adjust to a shrunken core business and a smaller slice of the pie, provided they are consistently innovative. They could react with a more active customer approach on site, especially in high-traffic inner-city locations. Branches are closing everywhere, but those that remain

are being converted into modern financial centres with chic designs, lounges or a coffee bar—because the need for personal exchange, especially in critical financial decisions, will always be there. Not for every customer, but for those who desire it. Credit banks can score points with more emotional sales methods and a target group-oriented ambience, with promotional campaigns and other undertakings. All one has to do is revamp customer relations with a new attitude. For it is the local bank employee—not those on Wall Street, in the City of London or in Frankfurt's bank towers—who enjoy a high level of trust. With direct contact, authenticity and empathy, they can better serve specific customer groups, needs, concerns or situations than apps or chatbots. To get fit for the future, however, banks need to completely rethink matters, EY writes: "Change must no longer come out of regulatory rules, but must be innovation-driven. The core of this is "digital maturity".[63] In addition, it is clear that banks will only become forward-looking and attract new talent if they establish and communicate an innovation process. "This needs to be driven from the top to encourage innovation and bring new insights and experience to the process."[64]

Money and unsecured fiat money

Let's talk about money—probably the most central element in a financial world. Without this "lubricant" with its very useful properties, no financial system in the world is imaginable. However, all money is not created equal, and comes in many forms and facets, as we will see in the course of this section.

The most important trait inherent in money is probably its **value**. And the value of "classic money" is simply what we be-

lieve it to be. Money always has an equivalent—but only what we ascribe to it. Moreover, it can constantly change. So the most important questions are: What can we buy from it? Can I use it to cover my monthly expenses? How many Swiss francs do I get for it? The opposite is also true: the amount of the rent, what a litre of petrol costs or how many euros I receive for the Swiss franc, all these are also expressed in a number. If we do not believe in this ascribed value of a currency—which is a form of money—or at least not in its specific strength, we flee into other currencies and alternatives, or demand more for our labour or, as a landlord, for the monthly rent, causing inflation.

Money is the equivalent of our products, services and work, and money, in turn, satisfies our material and often spiritual needs. "Money is paid for in the act of purchase. Without money, there is no developed barter society…," says Karl H. Brodbeck in *The Rule of Money*.[65] In addition to the valuation/value equivalent—which happens within a currency area as if by magic through billionfold daily transactions, valuation processes, contracts, state and also foreign interventions and assessments—another core function of money is that of **exchange**. We can exchange euros, dollars, zloty or even cryptocurrencies for one another, for bread and water and also for gold, gold certificates, shares of gold mine operators or virtual goods such as gold coins from a game—and vice versa. The last-named function is no mere trifle. The counterparty, and we as well, finally accept money only because we believe and hope that we ourselves will get something for it later.

All this, in turn, is based on **trust**—trust in the value of the currency that is supposedly guaranteed by the state or the money-issuing national bank. Nothing is guaranteed! Today there is no binding, fixed countervalue for a dollar or a euro, i.e. the

traditional and currently sole prevailing so-called fiat currencies without any intrinsic value. The countervalue is only the result of daily new negotiation. There is no guarantee for any equivalent value of the currency unit. Rather, money and our currencies are based on pure illusion and precisely the trust we give to the currency or the state/money system behind it. They are thus hopes, dreams, ideas, fantasies—and as long as all other participants in the monetary community see and acknowledge this in the same way, money fulfils its purpose as a form of thought.[66]

When confidence is shaken—not only because of political crises, but often also because of fundamental economic data—the curve does not only go down, of course. Depending on the counterpart, it also rises accordingly. The hyperinflation of the Venezuelan bolivar is accompanied by a high exchange rate for US dollars or tomatoes or a cup of local coffee. In Venezuelan bolivar, these elements are worth more with every day, indeed every hour with hyperinflation, which in this example reflects the decay of the bolivar rather than an increasing absolute strength of the equivalents.

It's different with cryptocurrencies when they go through the roof. The rise of bitcoin was by no means a flight from the other currencies, the transaction volumes were far too low for that, but were based on the belief that the value of bitcoin would continue to rise. A bitcoin was then simply worth as much as the people were willing to pay, at the peak around $20,000. Interestingly, the value of cryptocurrencies—explicitly launched as an alternative to classical currencies—is expressed in these leading world currencies. The blossoming of bitcoin is deliberately defined in its equivalent value to dollars, euros and the like. Also for exchange purposes (currently), it is essentially the traditional currencies that come into play. We can now buy a lot with bitcoin

and Ethereum, but we all still have in mind how many dollar or euros we will get for it. And even the pizza service that accepts bitcoin (and a pizza was the first product to be bought with bitcoin) converts its cryptocurrencies into the local currency and exchanges them for it as quickly as possible, just as the pizza seller of the first transaction did, for lack of alternatives at the time. If he had kept his money, he would have been a millionaire years later—of course, a dollar millionaire. Bitcoin's exchange options for other goods were extremely limited at the time, but someone had to make a start. As we will present in the course of this book, however, this is now changing—and it is one of our consciously set goals that the possibilities of cryptocurrencies, in our case the NAGA COIN, will become more diverse.

In the case of money, the exchange function and the valuation function are joined by the **transfer** function and the practical **payment unit/calculation unit**—not to be confused with the **means of payment**—and thus the transferability to any person. Money wanders, and this then on the basis of a means of payment such as cash, electronically by bank transfer, Visa card, Google Pay—or gold coins, as in the invention of money in 500 BC by the Lydians. At that time, it seemed quite practical, as Jack Weatherford describes it in his *History of Money*: "An entire warehouse of olive oil, beer or wheat could be reduced in value to an easily transportable gold or silver ingot." The fascination of a gold ingot has lost nothing to this day, but it is not exactly practical. And so gold coins were minted quickly, whereas today we only use a few grams of a plastic card to complete our transactions, often only with a weightless PIN or even by SMS, as with the Kenyan M-Pesa, which we will introduce later.

Money needs a standard, a **unit**—and this is precisely one of the dangers of money, namely, when the value is diluted, for

example by the filing off of coins, by use of bad alloys with a lower precious metal content or today by cranking up the money printing machine. For it is still the state that has the monopoly on currency and sets the guardrails for the values/evaluation, determined above all by the key interest rate and the money supply.

And of course, money also serves us as **value storage**—if we are of the opinion that it has a certain value (for us and above all in general). For this reason, we sell items or our work for money and hope that it ideally retains its (imaginary) value indefinitely. But the German philosopher, economist and business ethicist Karl-Heinz Brodbeck sees things differently: "That's why there is... no money function called a value storage either. Money is not an objective entity; it carries no value and therefore cannot store any value. Money in its various forms is a number tied to a unit of account. This arithmetic unit—this is its special feature—can be possessed in its materialised form and is then represented by coins, slips of paper or entries on accounts. The ownership of money... is of the highest abstraction."[67]

What is often overlooked: with the price that things are given (a pound of butter or a flight to New York), money transmits a wealth of information.[68] The price is thus a central information carrier, whereby a wealth of other information has flowed into this one data point. How much a kilo of wheat costs in Europe's dry summer of 2018, for example, was based on countless pieces of information, such as crop yields (i.e. supply), supply on the world market, demand (this also internationally) or speculations as to how it will probably turn out in the coming year. Not all farmers, and certainly not worldwide, were equally affected by the drought, but at the end of the day, there is only one price per quality class at a certain time or delivery date.

Money, then, forms the basis for our modern economic life and is thus one of the most important achievements of civilisation.[69] It is the modern economy and the abundance of goods and services that make money possible in the first place. Without money, our society would be highly inefficient—even beyond mere transactions. In terms of cultural history, the invention and introduction of coinage in Greece (and of paper money in China in the 9th century) was a basic prerequisite for the geographical expansion of the markets, away from the village, or at most the next town, to large parts of the Mediterranean, where the *Lydian coin* was accepted.[70] Today the whole world is in a tight spot, thanks to the dollar and currency markets, perhaps soon with the Chinese yuan or cryptocurrencies as the leading currency. Far-reaching trade relations across countries are only possible through this in the first place—just as the Italians did within Europe with the invention of the bill of exchange. And all this, i.e. flowing, moving money, is then also the motor of development: of ideas, exchanges between people, the new development of working methods, goods or means of transport. "In the market economy, the use of money overcomes the shackles of personal relationships. With the abstraction of utility value, the chance of an international division of labour grows. It increases productivity. The distribution of goods, risks, time and location differences can be controlled without regard to personal ties," says Udo Reifner.[71]

A few thousand years after Lydia, the Italian invention of the bill of exchange, i.e. a means of payment, gave a great boost to the exchange of goods in modern Europe. A bill of exchange is a document whose issuer confirms by paying a specified amount of money to a specific place and recipient—or to a third party named therein. Such a deed of obligation, which at the same

time was a loan, was even easier to transport than a gold bar or coin— and it was only valid for the person named in it. The ever-present danger of theft was thus also somewhat averted. Bills of exchange represented such a financial innovation, expressly designed for distant, international locations, that high penalties were imposed on bill fraud—after all, it violated the basic consensus that money has, namely trust. In 1569, Pope Pius V confirmed the Bologna Exchange Edict, which gave the paper its own legal order.

Money thus contributes to everything that constitutes modern societies, to social progress and to innovation—whereby money in its countless forms is itself an innovation. Some of them we will illuminate. Indeed, it is through money that culture—in the broadest sense of the word and as we know it today—has developed in the first place, and it "enables society to be organized to a much greater extent than could be achieved through family structures and violence," as Jack Weatherford writes.

So money has innumerable and above all practical advantages, but the crux is always there: people have to believe in the value of the respective currency, while the central bank has to do everything to keep the value of money stable. Both go hand in hand, and are based on basic economic laws that (in the medium and long term) no one can outsmart, however often it has been attempted in history. The Roman-Byzantine gold currency of Solidus, for example, was introduced at the end of the 4th century and had an astoundingly long existence. For almost seven centuries, it kept its value due to the stable gold content of 955 and 980 thousandths. When this was changed by rulers little by little, it began its slow descent, which only came to an end almost 1,000 years after the introduction of Solidus, namely,

with the conquest of Constantinople in 1453. So far, no other currency has achieved such a proud record.

The state "guarantees" with its central bank because it is strong and because it stands for law and order and the legislator, and of course also for tax revenues and value possession. Many central banks around the world still hold gold as a currency reserve, even if no currency is backed by gold and the hoarded gold could come nowhere near to making any difference and serves only to calm the situation and as a limited intervention vehicle. There is nothing more behind this guarantee, which is not even formally or legally expressed, but simply exists.

Money is "above all a concept of the people, one with which they organize their cooperation, which is aimed at economic success, in communities and societies," says Udo Reifner in his major work *Das Geld* and continues: "Money is a meaningful simplification of views that lead to trust and cooperation".[72] Money therefore also means the future. Money gives you the opportunity to build something. Of course, money is not everything, but it is an incentive, for example to start a business. The "invention" of money also meant that one can increase it through investment or one's own hands work. Money has also laid the foundations for our modern economic system. Anyone who believes in the value of money and the general conditions are right will not only consume, but will put money aside for the future or invest it or establish something with it—and this especially on the basis of credit, i.e. without having to save the sum beforehand. Only in this way is growth and prosperity possible, or as Brodbeck puts it: "There is nothing lasting about money, nothing preserving it. Money is in essence—because it seems empty—not only devoid of meaning. It evokes endless activity to participate in this emptiness through renewed market participation."[73]

Growth and the associated material prosperity are the result of investments that in turn enable future production and services. The money for this comes from loans, which is why Mathias Binswanger uses the term *credit money management*. "The advantage of this method is obvious: in order to create something new, one does not have to use one's existing assets or save for what would limit consumption. So these loans actually create 'money out of nothing', they are additional money with which one can buy more and which in turn gives the sellers more income. More and more money is being created, and in the end, everyone is getting something out of it, investors, shareholders, entrepreneurs and employees, whose wages and salaries are rising, and of course the state, which can collect more taxes.[74] At some point, however, the financial sector became so strong that it decoupled itself from the real economy. Binswanger: "The problem is simply that there is more money available in developed economies than there are useful ideas and opportunities for meaningful investments in the real economy that can also be used to earn something".[75] And further: "Money looks for new yield possibilities on the financial and real estate market. Here we are at the risk of speculative bubbles, i.e. exaggerated expectations in these fields, which burst with great noise...."[76]

Growth is, of course, interrupted—and quite a bit in terms of world history—by inflation, currency reforms, financial crises and, of course, loss of confidence. By then at the latest, people look for a safe haven and alternatives for their valuables—and have usually done so before, often in the form of other currencies or gold. This is because secretly not everyone trusts the official monetary policy, and so the flight into alternatives is often also a race between the hare and the tortoise. After all, the state

tries everything, especially if trust is not quite so justified, to prevent its citizens from doing so or to withdraw or regulate the alternatives, because they are also worth a great deal in the eyes of the state. Not only in Germany was it necessary to "give gold for iron", the USA of modern times also banned private gold ownership in 1933. Today, however, it is mainly soft currency or authoritarian states that are limiting the flight of foreign exchange. China is trying to restrict trade in cryptocurrencies, while other countries have banned it altogether. Such developments are therefore always also an (anticipated) reaction of citizens to possible undesirable developments: these fears are the exact counterpart to the belief in a hard currency and the dream of a prosperous future.

Historically, the advance of confidence in a currency and its guardians is hardly justified. At the end of 2016, 86 per cent of India's rupee cash holdings were literally taken out of circulation overnight. Official objective: a fight against corruption. The banknotes had to be exchanged—but under strict rules. Since many banknotes had not been legally acquired, but often through bribery, they usually became worthless, as their validity could be maintained only by the controlled deposit on a bank account.

And the money in our account is perhaps the greatest illusion. Unlike the much sought-after "true cash" in our hands, it is only a demand deposit, a payout promise; it is really not there at all! An estimated 92 per cent of the money supply exists only digitally in computer systems.[77] Money is therefore a pure fiction, an unsecured promise of the issuer. If the state so chooses, often at the stroke of a pen, everything can be lost or at least halved from one day to the next. This was the case in West Africa on 11 January 1994: France had secured power and influence there with the

CFA franc—a currency community of a dozen mostly former French colonies. For decades, it guaranteed the value of the CFA franc against the franc (and now the euro), since 1948 at a value of 50 CFA francs to one French franc. Of course this has/had its price for both sides. At the beginning of the 1990s, the high value of the CFA franc against the French franc could no longer be maintained, so from one day to the next. France doubled the CFA sum it demanded for a French franc. If you had to pay 50 francs CFA for one franc before, this was 100 the next day without prior notice—which is the sense of such actions.

The bottom line was that the social and economic consequences were devastating, even if there were slight advantages: prices doubled, while wages and salaries remained at the old level. Imports suddenly became more expensive, while exports of cocoa or coffee, for example, experienced a boom, as producers now received the equivalent of twice as many CFA francs. France, on the other hand, was left with no choice: what one could really do with the CFA franc was not worth as much as the *Grande Nation* had guaranteed. Compared to other Third World Countries, the currency was and is extremely stable, just as stable as the franc (and today the euro)—albeit at the price of a continued strong dependence of the ex-colonies with many negative consequences, such as relatively high prices.

What the franc and now the euro is for 14 West African countries with their franc CFA, namely anchor and reference point, is the dollar for the world. The "greenback" is by far the world's leading currency and thus the epitome, but also the practical expression, of "money": "The dollar performs the functions of money for international transactions more than any other currency," wrote the American economist Jeffrey D. Sachs recently in a globally distributed guest commentary: "It is the most im-

portant settlement currency for international trade. It is the main medium of exchange for the settlement of international transactions. It is the main store of value for the world's central banks."[78] Despite many other strong and stable currencies, not least the euro or the Swiss franc, the dollar is the undisputed leader, especially as some commodities such as oil are valued, traded and settled almost exclusively in dollars. The (current) dominance of the dollar is gigantic, "and the dollar is the central credit currency, because most of the loans taken out by companies and governments in foreign currency are denominated in dollars".[79] Its dominance is more in keeping with political power than with the actual position of the US economy in the world, with a 22 per cent share of production, while the dollar accounts for "half or more of all cross-border bills, currency reserves, settlements, liquidity and credit".[80] Thus, the USA has created an instrument of power and control without equal, which, however, is showing scuff marks through the rise of China with its renminbi/yuan. Sachs emphasises the three great advantages that America can currently derive from its money power:

1. The ability to borrow abroad in one's own currency—and on conditions dictated by the US Federal Reserve and the Treasury. Another reason why the US is so heavily indebted is that many states own dollars (through trade, as is the case with China or oil, as with Saudi Arabia) and immediately invest them in US government bonds.
2. The economic factor "Wall Street", with considerable income from banking services and trading in financial products.
3. Regulation and governance: the US has its thumb, sometimes together with Western partners, on the essential

> systems for global settlement. This allows them to monitor and limit capital flows, especially in terms of illegal or politically unpopular activities.[81]

As "practical, inexpensive and safe" as the leading currency and money function is for the world, it is of course a tough instrument of power, and always has been. The Bretton Woods system with its dollar-gold price fixation, which we will discuss later, was dictated by the USA and later discontinued. Behind Saudi Arabia's decision to trade oil only in dollars—a fantastic deal for the USA because all other oil states followed suit—was political pressure à la carrot and stick. And in general, monetary policy, interest rate policy and thus also inflation policy have never had the interests of other business partners in mind. This was one of the reasons why the euro was created and the renminbi internationalised, as other economically strong countries and regions no longer wanted to be completely at the mercy of the USA. Last but not least, the distortions of the financial crisis, which started in the USA and were thus critical of the system, have plunged financial institutions everywhere into the abyss and led to a severe global economic crisis.

However, all the capers and one-sided decisions—which have always existed, even long before Trump—eventually let the barrel overflow. Germany's Foreign Minister Heiko Maas recently declared that Germany was interested in setting up a European payment system independent of the USA. It is "essential that we strengthen European autonomy by establishing payment channels independent of the US, creating a European Monetary Fund and building an independent Swift system," he said.[82] In a new financial order, however, China will presumably win the race. It is a centralized state, not an international organization

like the EU with two dozen entirely different members, and more power-hungry. And the course has already been set in some small ways. In the "Gold" chapter, we will briefly describe how China is setting up its own gold exchange (which will harm the financial centre London), and at the same time, China has just successfully launched activities to negotiate oil contracts. All in their currency, of course, and in Shanghai.

But the example of the USA in particular—with its enormous national debt—shows that the fiat money of the central banks is completely unsecured and in our opinion a story of endless failure, even if it need not be as bad as in Zimbabwe when there were 100 trillion notes in the economic crisis under Robert Mugabe. Statistically, its lifetime is limited, and its value is constantly decreasing. Central banks are able to control inflation and deflation via interest rates—which is not good for money as a store of value. However, cryptocurrencies and blockchain alone would not change such mechanisms. We should have no illusions about this. The state will always reserve the right to determine the currency—and it will avail itself of it. Nevertheless, the solutions discussed in this book will replace the form of money we know today. The alternatives are there, although not yet fully developed. In view of the short product cycles, i.e. the rapid pace at which products are made marketable, we will experience many of the things outlined here within the next 15 years at the latest. Cryptocurrencies and above all blockchains will come—if only because the states are eager to collect taxes through them. In our opinion, this alone is a lever that will establish blockchain from the state's point of view—and thus also bring with it its other functions.

Expensive, restrictive and impractical means of payment

So we urgently need money—for calculating and charging, exchanging, evaluating, storing and boosting the economy. But in what form, with what effects and at what price? And this does not only mean the financial aspect. This is what this section will address.

Cash and other traditional means of payment

If payment methods enter the race, cash is still ranked number one among private individuals in some countries, for example in Germany, which sets an almost crass example in this area:

- In terms of turnover, 48 per cent of all payments in Germany are made in cash, 40 per cent by card (debit card 35 per cent, credit card five per cent). This was reported by the Deutsche Bundesbank in February 2018 in a large-scale study on payment behaviour.
- Per transaction, the picture was even clearer: the cash share was 74 per cent, albeit with a slightly negative trend compared to the 2014 study. Debit cards accounted for only 19 per cent of all transactions.
- In particular, small amounts of up to €5 are paid almost exclusively in cash in Germany, namely 96 per cent, even though the heavy loose change in one's wallet is so annoying.
- Up to a purchase value of €50, most respondents predominantly use cash, only then do cards or electronic means of payment increasingly come into play.[83]

- In the survey conducted in 2017, contactless card payments accounted for just over one per cent of sales.
- 36 per cent of Germans have only a single credit card, 98 per cent a debit card (girocard, the former EC card).
- The European average for cash payments is 32 per cent.[84] At 17 per cent, France even undercuts the figure from the USA.
- In the home country of the credit card, there are now even more debit cards than credit cards.

The peoples of other countries also love cash: Austria is just behind Germany, as a representative study by ING-DiBa has determined. The Czech Republic, Poland, Italy and Romania also have shares of 35 per cent and more.[85]

However, payment behaviour in European metropolises such as London is already showing the way to a completely cashless world: contactless payment is virtually the norm there for amounts under £30. Germany is a very special candidate worldwide in terms of the love of cash and also in terms of conservatism and is likely to be one of the last bastions to oppose the trend towards digitalisation. Since the introduction of euro notes and coins on 1 January 2002, circulation has more than quadrupled to 1.171 trillion euro. And almost unbelievable: half of the cash in the euro zone is circulating in Germany.[86] In addition to the sum, which characterises chronic cash payment behaviour in Germany, this is also evident in certain payment locations or purposes: payments between private individuals, for food and drink in the pub and at vending machines are predominantly settled in cash. So it's no wonder that the three ATMs operated by Hamburger Sparkasse on the Hamburg Reeperbahn (nightlife/red-light district) together spit out €29 million a year—more

Share of payment instruments by revenue
according to payment log book

Payment instrument	Revenue in euros	Share in %			
		2017	2014	2011	2008
Cash payment	297,901.48	47.6	53.2	53.1	57.9
Card payments					
Debit card (without contactless)	212,576.36	34.0	29.4	28.3	25.5
... with PIN [1)]	172,820.22	27.6	24.3	20.9	–
... with signature [2)]	39,756.15	6.3	5.1	7.4	–
Credit card (without contactless)	27,578.11	4.4	3.9	7.4	3.6
Contactless card	7,103.04	1.1	0.1	0.1	–
Debit card	5,690.37	0.9	–	–	–
Credit card	1,314.22	0.2	–	–	–
Other	98.45	0.0	–	–	–
Customer card	411.71	0.1	0.1	0.1	0.2
Prepaid card	83.83	0.0	0.0	0.1	0.6
Canteen / stadium card	180.01	0.0	–	–	–
Other cashless payments					
Bank transfer	34,749.06	5.6	5.3	8.2	8.9
Debit	15,180.80	2.4	3.0	0.7	1.9
Internet payment procedure	23,258.40	3.7	2.8	1.7	0.3
Mobile payment procedure	123.76	0.0	0.0	0.0	–
Other	1,005.63	0.2	0.1	0.2	0.4
Cashless, without data on payment procedure	5,949.32	1.0	2.3	–	1.0
Total	626,101.51	100	100	100	100

¹ Payments by girocard and debit card products of international card schemes.
² In accordance with girocard payments via electronic direct debit (ELV: Elektronisches Lastschriftverfahren)

Source: Payment Behaviour in Germany 2017 - Fourth Study on the Use of Cash and Cashless Payment Instruments, Deutsche Bundesbank

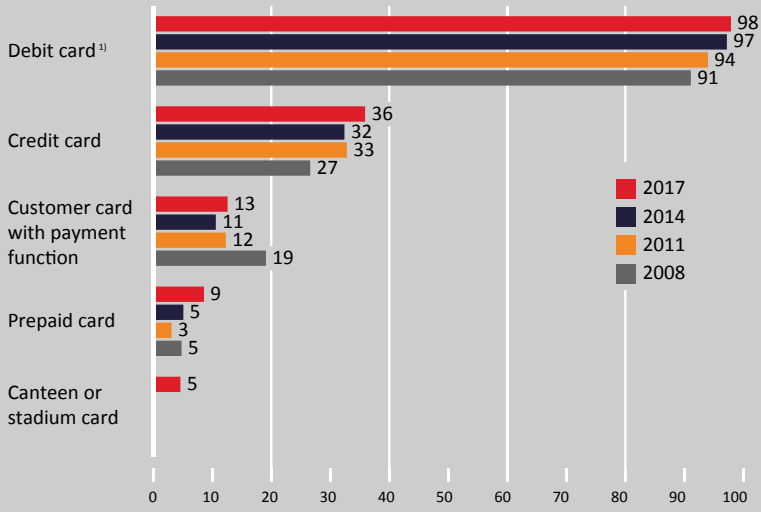
Share of payment instruments by number of transactions
according to payment log book

Payment instrument	Number of transactions	Share in %			
		2017	2014	2011	2008
Cash payment	15,864	74.3	79.1	82.0	82.5
Card payments					
Debit card (without contactless)	3,941	18.4	15.3	13.4	11.9
... with PIN[1)]	3,238	15.2	12.5	10.1	–
... with signature[2)]	703	3.3	2.8	3.3	–
Credit card (without contactless)	328	1.5	1.3	1.8	1.4
Contactless card	147	0.7	0.1	0.0	–
Debit card	114	0.5	–	–	–
Credit card	27	0.1	–	–	–
Other	6	0.0	–	–	–
Customer card	12	0.1	0.0	0.1	0.1
Prepaid card	6	0.0	0.0	0.2	0.7
Canteen/stadium card	37	0.2	–	–	–
Other cashless payments					
Bank transfer	275	1.3	1.0	1.3	1.8
Debit	135	0.6	0.5	0.3	0.6
Internet payment procedure	398	1.9	0.9	0.7	0.1
Mobile payment procedure	12	0.1	0.0	0.0	–
Other	33	0.2	0.1	0.1	0.2
Cashless, without data on payment procedure	173	0.8	1.7	–	1.0
Total	21,361	100	100	100	100

¹ Payments by girocard and debit card products of international card schemes.
² In accordance with girocard payments via electronic direct debit (ELV: Elektronisches Lastschriftverfahren)
Source: Payment Behaviour in Germany 2017 - Fourth Study on the Use of Cash and Cashless Payment Instruments, Deutsche Bundesbank

Possession of payment cards

Data in %, according to information supplied by the respondents



1 Girocard and debit card products of international card schemes.

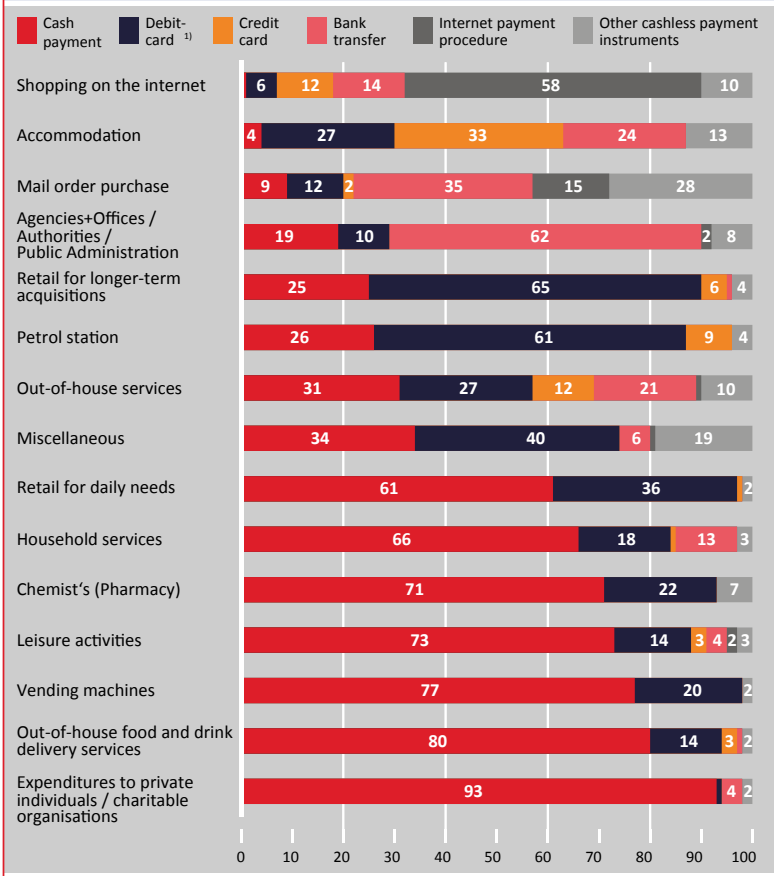
Source: Payment Behaviour in Germany 2017 - Fourth Study on the Use of Cash and Cashless Payment Instruments, Deutsche Bundesbank

than any other ATMs in Germany.[87] Especially on weekends, pleasure seekers line up in long queues before they paint the town red. It is well known that companies and other service providers on the strip prefer cash. Bitcoin was originally favoured by many for "private purposes" in particular, due to its alleged, but in fact non-existent, anonymity. More on that later. The market may even respond to this traceability with completely new cryptic "anonymous currencies."

At least the growth rates for modern means of payment such as contactless card payments, Internet and mobile payment

Use of payment instruments by payment location or purpose

2017, data in % of revenue, according to payment log book



¹ Girocard and debit card products of international card schemes.

Source: Payment Behaviour in Germany 2017 - Fourth Study on the Use of Cash and Cashless Payment Instruments, Deutsche Bundesbank

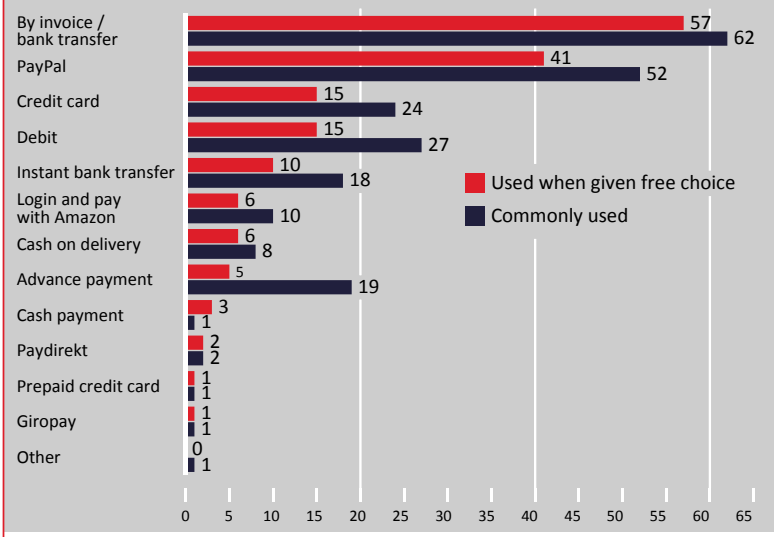
methods are high. Younger consumers in particular are seeking alternatives to traditional payments, and in China, for example, it is a completely unprecedented matter-of-course payment method. The Middle Kingdom is a leader in this field, and this is also due to its fundamentally different attitude towards new technical solutions. As early as 2016, the "mobile payment" market there was valued at $5.5 trillion, 50 times higher than in the US.[88] But it doesn't matter what payment method is a step ahead. The basis for the time being, even for Google Pay, is and will remain the current account.

Not only technical progress, above all digitalisation and customer needs, are shaping developments, but also the tough economic conditions already described in the chapter on banking. The long-standing low-interest environment and the loss of revenues are forcing commercial banks to change their fee policy—which can affect the attractiveness of the respective means of payment.

In spite of all this, most people may not even be aware that every payment method has its costs. Cash, for example, does not come out of the vending machine free of charge, but is quite expensive in the final analysis: the entire processing, the production, the counting of the notes, the rolling of the coins and the logistics are all costly. The Deutsche Bundesbank alone still has 35 regional branches, and each employee entrusted with cash there processes an average of more than 20,000 banknotes a day. Ludger Gooßens, a former board member of the German Savings Banks and Giro Association, estimated that in 2014 the savings banks alone spent €1.1 billion a year on handling cash.[89] In addition, there are excessive regulations, such as the Cash Verification Ordinance, which would also be a nasty blow. And the costs of implementing the EU Coinage Regulation are many

Payment of purchases on the Internet

2017, data in % of revenue, according to payment log book



Basis: Repondents who shop not less than rarely on the Internet. Multiple responses possible.
Red bar question: Which of these payment procedures would you use if you had the free choice?
Blue bar question: How do you usually pay for your purchases over the Internet? 2017, data in %, according to information supplied by the respondents

Source: Payment Behaviour in Germany 2017 - Fourth Study on the Use of Cash and Cashless Payment Instruments, Deutsche Bundesbank

times higher than the value of the 52,063 counterfeit coins. Their total value was €100,000, while each medium-sized savings bank had investment costs of €400,000 for special counting machines alone.[90] Of course, as with all control procedures, it is also necessary to take into account the deterrence mechanism, which can hardly be estimated.

Producing small coins incurs costs roughly equal to their face value. If raw material prices were to rise, the production of coins would even become uneconomical.[91] Not to mention they would

be better taken to a metal merchant. But that's not all: guarding, logistics and, above all, the transport of cash also demand huge sums of money. The main cost factor is once again money in the form of heavy coins,[92] which, on top of this, is often hoarded by the citizenry,[93] so that it is necessary to diligently produce new ones. Deposit and booking fees at banks make the situation even worse. All in all, the Bundesbank estimates costs of half a per cent of Germany's gross value added for all cash payment transactions and one per cent for all payment methods combined. Germany's economic strength accounted for €3.26 trillion in 2017. Half a per cent for cash alone, that would be a whopping €16.3 billion! However, if one considers the internal costs of companies and private individuals when dealing with money, the relevant Bundesbank study even calculates costs of at least two per cent of GDP.[94]

Anyone who now wants to abolish cash for this reason alone should be warned: the other means of payment also have their price—and this is not lower. We will in any case discuss the absurd electricity costs for mining and the transfer of bitcoins. In fact, a major international study carried out in 2016, involving 13 Eurosystem central banks found that cash was more cost-effective in terms of the average cost of a transaction than the non-cash payment instruments examined. In terms of sales, however, the debit card again won the race.[95] Anyone who is confused now shouldn't worry. Even Carl-Ludwig Thiele, until the beginning of 2018 member of the Bundesbank executive board, drew the following conclusion in the *Börsen-Zeitung*: "This study, like other studies, paints an ambiguous picture of the costs of different means of payment."[96]

Beyond purely financial aspects, however, cash has many advantages, as Bundesbank President Jens Weidmann has pointed

out: “Cash is perceived as a simple, secure and fast means of payment. It also helps to control expenditure and plan the budget. With cash, goods and services can be paid for anonymously and directly, without the seller or buyer of goods having to pay in advance. It can be used for payment without a technical infrastructure and it ensures the functionality of payment transactions in emergency and crisis situations,” said Weidmann at a 2016 Bundesbank symposium on the subject of cash.[97] A better advocate for cash is hard to imagine. An essential feature of cash is likely to play a particular role in this great love for cash payments: there is no link to its owner. When, on the other hand, digital payments are made by electronic means, every transaction leaves a trace. Incidentally, euro cash payment is limited in twelve of the 28 EU states, albeit for different amounts. Moreover, the phase-out of the 500-euro note was sealed by the ECB in 2016. Its production will be discontinued by the end of 2018, but it will remain legal tender for the foreseeable future.[98]

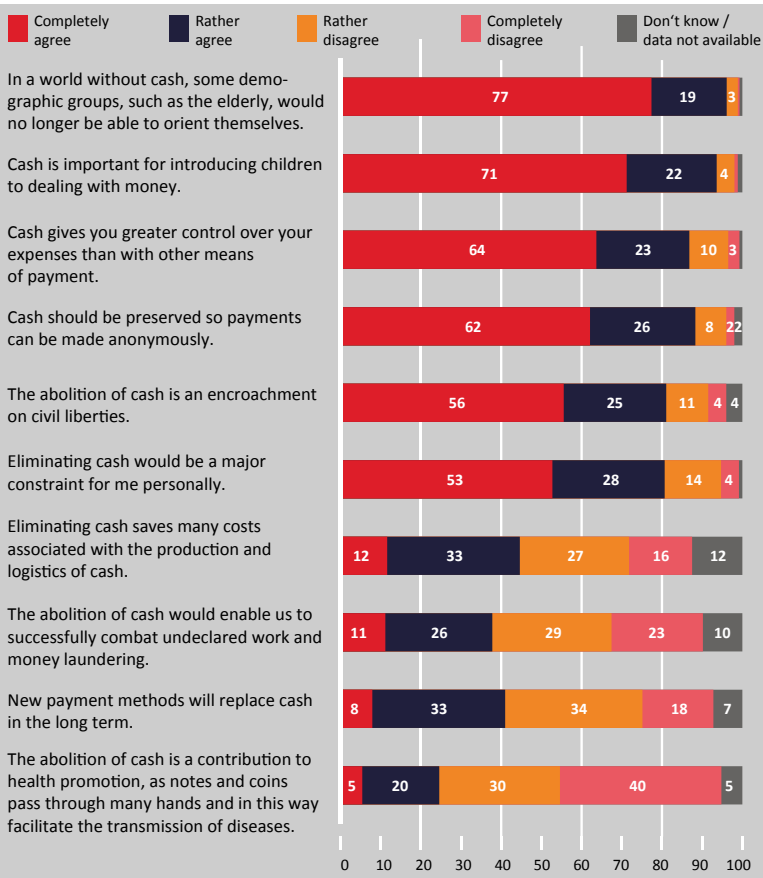
Nevertheless, for years, especially in politics and academia, there have been major discussions about the abolition of cash. The economist Kenneth Rogoff has dedicated himself to this task for years, gathering his ideas two years ago in his book *The Curse of Cash: How Large-Denomination Bills Aid Crime and Tax Evasion and Constrain Monetary Policy*. He sees paper money as lost in the medium term and only allows a certain need for small banknotes, until they have been completely exchanged for coins. Like many other cash critics, he cites abuse by organized crime, tax evasion and illegal employment. These manifestations are heavily dependent on cash and, in his opinion, account for the bulk of cash in circulation. For him as well as for other fans of “control by means of payment"—we number among them and will outline our ideas in the second main part of the book—cash in particular prevents

a further reduction of the key interest rate well below the zero per cent limit, which is not our explicit goal. But we see the great charm of purely digital payments, for example with a system of cryptocurrencies, in the possibility of being able to make adjustments much more efficiently. More on that later. But Rogoff of all people sees the stuff of the devil in cryptocurrencies—for us *the* solution—and calls on governments to prevent people from resorting to these and other alternative transaction media.[99] Cash fans, on the other hand, can be sure of the support of the Bundesbank. Carl-Ludwig Thiele also wrote in the *Börsen-Zeitung:* "There is however no evidence known to the Bundesbank that restrictions on the use of cash actually help to reduce tax evasion or crime."[100]

In Sweden, however, there may be a different extreme: there, traffic in cash has been literally abolished. Only 20 per cent of all transactions are still carried out with cash, compared with only five to seven per cent by value.[101] For years now, almost all transactions there have only been processed electronically or with mobile payment systems, especially small amounts, be it in the pub, on the bus or even at the collection in the church. In most cases, cash is no longer accepted there, although it is the country that first introduced banknotes in Europe, in 1661. This makes it the world's most cashless country.[102] At many shops and restaurants, "No cash accepted" signs show that the writing is on the wall. Obviously so widespread that the legislator is now getting cold feet and has therefore commissioned a study. Mats Dillen, the responsible MEP, said of the interim result: "If the development of the disappearance of cash proceeds too quickly, it could be difficult to maintain the infrastructure to organize cash movements.[103] He is thinking in particular of older citizens who do not have access to digital society. Dillen even fears a "negative spiral that could threaten the cash infrastructure."[104]

Assessments of cash

2017, data in %, according to information supplied by the respondents



Source: Payment Behaviour in Germany 2017 - Fourth Study on the Use of Cash and Cashless Payment Instruments, Deutsche Bundesbank

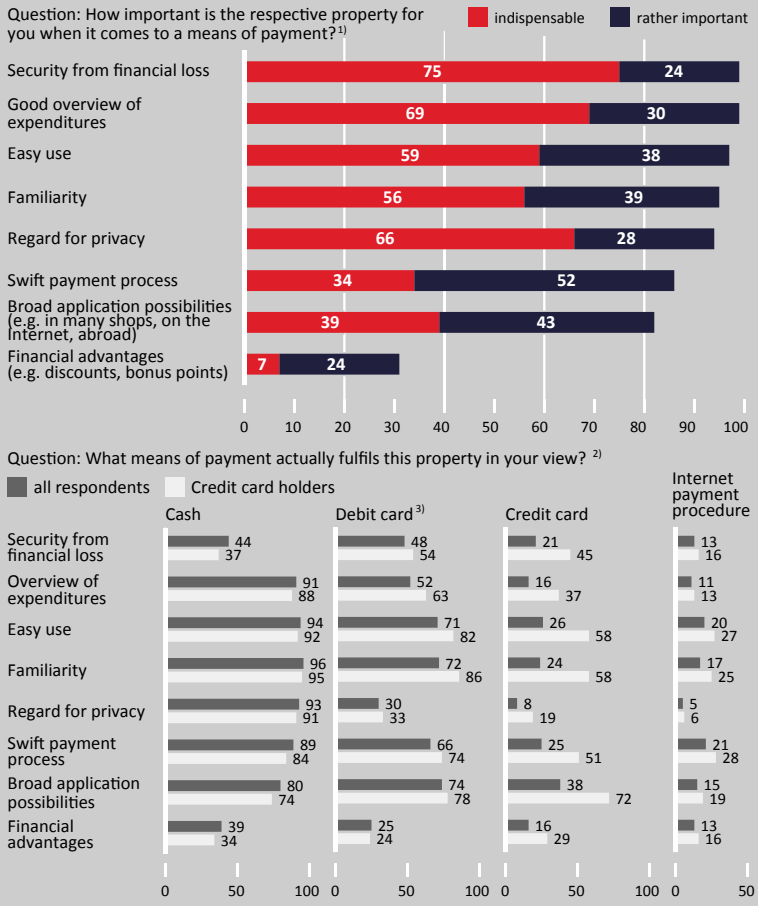
It is understandable that in times of crisis one would prefer to have recourse of using cash. But to avail oneself of it after the outbreak of such a crisis, of all times is not a good idea. By then, it is usually too late, as the long queues in front of ATMs during the banking crises in Greece and Cyprus showed us only a few years ago. Not surprisingly, the Bundesbank, the safe bank when it comes to cash, points out the great importance of cash in such uncertain times. One of its countless studies states: "In periods of crisis, especially financial and payment crises (systemic risks), trustworthy cash should be the means of payment 'of last resort'. The existence of cash can be advantageous when non-cash payment systems fail wholly or partially due to technical problems."[105] Despite all the prophecies of doom—also in Germany—that cash will soon be abolished, the Bundesbank is proving to be a real bastion of calm.

Michael Miebach, the top product manager at the US credit card company Mastercard, also takes a critical view of expensive cash transactions—even from his job description—and points to similar figures as those from the Bundesbank: "Running a cash industry costs an economy around 1.5 per cent of economic output, which is a large cost factor."[106] The German who lives with his family at the company headquarters in New York is not witnessing the end of cash in the USA, either: "In America, my cash stake is even higher than in Germany. It's the tipping culture there, a dollar here, a dollar there. Unfortunately, there is still no good solution to replace banknotes for tipping. We'll have to think of something else."[107]

Even Giesecke & Devrient, one of the world's largest private service providers for printing banknotes, does not see cash as being near its end by any means. CEO Ralf Wintergerst: "The supply of money, especially in large territorial states, is part of

Requirements for means of payment

2017, data in %, according to information supplied by the respondents



[1]Basis: all respondents. [2] Basis: all respondents and only credit card holders. [3] Girocard and debit card products of international card schemes.

Source: Payment Behaviour in Germany 2017 - Fourth Study on the Use of Cash and Cashless Payment Instruments, Deutsche Bundesbank

the basic infrastructure; these countries cannot easily switch over to digital payment systems".[108] The company, now a high-tech group, produces around five billion notes a year. The banknote division holds 48 per cent of the consolidated turnover of €21.4 billion for the company, which is increasingly becoming a digitalisation specialist.[109]

Alternatives

The numerous alternatives to cash are diverse and often very creative. The **Rai** stone money from Micronesia in the Pacific, for example, with a diameter of up to four metres and a weight of up to five tonnes, has been used for centuries and is still valid as a means of exchange and payment. Although production was discontinued in 1931, the stone discs set up by the wayside on Ulithi Atoll still have their practical and symbolic uses, for example in land transactions. If the owner changes, however, the weighty object is not moved; rather, the new owner is recorded in the collective memory of the village elders. Trust in the value—and the property rights—seems to be deeply rooted in the DNA of the people.

It is not always easy to draw the line between currencies and means of payment. And in everything we must not forget that the state always has the monopoly on currency. If it is of the opinion that certain alternate ideas are getting out of hand, need to be regulated or restricted, it will do so. Already in the last section on cash, we touched on some means of payment—which, we believe, hardly need an introduction. Debit cards/credit cards have long since been introduced and proven, although in the case of credit cards in Germany, they are surprisingly uncommon. But this is also due to the great success and spread of deb-

it cards. Other means of payment are quite new and have only recently emerged. The alternatives include, above all, other forms of currency—in which one takes refuge, using them as a precaution or for speculation, among other reasons because one's own currency or fiat money generally seems too weak and insecure. Gold, cryptocurrencies and alternative/local currencies, which is a niche product, have been relevant here for some years. We will come to cryptocurrencies in a separate, central chapter. In situations where the official currency was too weak, people have always tried to make ends meet by means of alternatives. Often this was another official currency, frequently the US dollar or the Deutschemark in the '80/'90s in Southern and Eastern Europe (in these regions, sometimes even with an official status). Legendary are substitute products, such as **cigarettes** in post-war Germany or in Romania under Ceausescu. They can also fulfil monetary functions: they have a value, one can count on them, they serve as a means of exchange and payment, and they are also suitable as a store of value. As always, the prerequisite here is trust, otherwise in the end all that remains is for one to smoke away the value of one's cigarettes into thin air. Nor should we forget that the reason for the alternative currency is often a malfunctioning or overly weak official currency, so the alternatives are often born out of a deficit, a makeshift solution—and immediately disappear and lose value when order and confidence are restored or other official solutions are introduced. In addition, many alternative currencies or innovative means of payment do not necessarily have all the important monetary functions. And many of them are still based on the current account—it is therefore expressly no solution for all those masses of people who do not have an account.

Money transfer services

Hundreds of millions of people worldwide use the money transfer services Moneygram, Western Union or Ria to transfer the money they earn in North America, Europe or the Gulf States to their loved ones at home: to Africa, Asia or South America. Deposits and withdrawals are made almost exclusively in cash. The fees for this—and it would be a dream come true for sorely afflicted German banks—can, however, be horrendous. An Indian construction worker in Dubai who sends most of his monthly salary to Bangalore has to shell out possibly 15 per cent, depending on the sum involved. If you imagine that these people and their families need every cent, it is no wonder that alternatives that avoid these cost traps are spreading. Archaic incoming and outgoing cash payment—with intermediate high tech to transfer around the world in seconds—naturally gives rise to personnel costs. If one makes the same transfer online, one can already make significant savings today. Often, however, there is no Internet access at the other end—even in India, which is so technologically advanced, or in Africa, with its high level of affinity for mobile phone communication—especially among the families of guest workers.

In Africa, for example, Western Union has spread to such an extent that it can charge high fees there, of all places. They have been the subject of criticism by the EU, the World Bank and even the G8 leaders for this. Because of these unfair fees, the World Bank even placed a page on the Net where people could find out about other service providers. The topic was of such significance that it actually made its way into world politics: at the G8 summit in Italy in 2009, a goal was set, the object of which was the reduction of processing costs. Not much has

changed since then—except that new providers have entered the market, such as the FinTech transferGo, which offers cheap opportunities from London for Eastern European workers based there to send money home via the Internet or smartphones; or that the established competition is offering extremely low online rates, following Kenya's lead, even directly to one's M-Pesa account. (More on this later.) Here only a fraction is due, but given the high importance of cash, especially in Third World Countries, this only works in selected countries and regions.

Google Pay and Apple Pay

Google Pay, (launched at the end of 2015) and **Apple Pay** (launched in 2014) allow you to pay with your Smartphone/iPhone. Google and Apple Pay require a corresponding app, which is connected to the credit card of the customer's bank. As has been the case for several years with contactless credit card payment at the checkout, one's mobile phone is held against the card reader, which then beeps. Admittedly, many costly "financial intermediaries" are again involved here: the credit card company, the credit card issuing bank, Google, the technical service provider for processing the payment, the supermarket/business, on and on the list goes. What goes smoothly in the twinkling of an eye with a brief tap on the reader and a control tone for the consumer further sets in motion an enormous machinery in the background, even though it has now been fully automated and digitised. In Germany, for example, Apple requires a 0.15 per cent revenue share (in addition to a fixed fee per customer) from banks—quite a bit, given 0.3 per cent, which the financial institutions only receive from the trader in the first place. No one knows how the negotiations turned out. Google,

in any case, does not take money from banks, but for that, of course, the consumer's shopping data.[110]

On the subject of information, this is the main fear of many when they think about giving up cash. Mastercard, for example, evaluates customers' purchasing data, but only in summary form. The company does not in any event have the customer's name, address or other personal data. These are held exclusively by the banks that issue the cards. The company can only see the 16-digit card number for billing purposes. "We don't have a single customer name or address in our database," says product manager Michael Miebach.[111]

But no matter how you look at it: there will always be costs—whether transparent or hidden, direct or indirect—especially since with Google and Apple in particular, new financial service providers have arisen who want to secure their piece of the pie, and ultimately also have to, because their services are of course not free of charge. Incidentally, the life cycle of a single payment is highly interesting: the two economic authors Michael Casey and Paul Vigna have described the normal path of a credit card payment in their book *The Age of Cryptocurrency: How Bitcoin and the Blockchain Are Challenging the Global Economic Order*—using the example of a coffee purchase at Starbucks. They counted seven service providers—and that was before Google and Apple Pay. With these financial innovations at the latest, the medium for payment at the checkout has changed. Whereas in the past it was cash and a cheque and later a card, it is now the mobile phone or even the Apple watch that is making contactless payment possible.

Gold

Enthroned above all alternatives, however, is gold. But here, too, we are unfortunately forced to point out that the value of the precious metal is based on pure fiction, even though this has been going on for thousands of years. Gold has a kind of intrinsic value to it, but the important exterior is again expressed in unsuitable fiat currency. The relation between the two is thus also an indicator of the perceived strength of each other, and for some time now, the price of gold has been stagnating or even falling.

Gold has a major function as jewellery—particularly widespread in India and China—and is responsible for 50 per cent of total demand. But especially in the West and rest of the world, gold serves as a safe haven, as a way out of seemingly unstable currencies and partly also as an investment and speculation object, even if its price has not given cause for joy in the past years. Unlike the central banks' fiat money, gold has the charm of being limited in quantity and of necessitating a great deal of effort in production and extraction from the mines. One rubs one's eyes in disbelief to think how little gold has been mined over the history of mankind: just 187,000 tonnes, says the World Gold Council. That would be worth about $7.5 trillion.

The central banks, of all institutions, are relying on gold as a currency reserve of around 30,000 tonnes (while the citizens of India own 20,000 tonnes of jewellery). Why them in particular, seeing as how central banks no longer cover one currency with it? This was different until 1973. Until then, the famous Bretton Woods system, dominated by the USA, had existed. Core functions: a fixed dollar exchange rate against the participating currencies and a fixed peg of the US dollar to gold. This in turn was

linked to the American guarantee to exchange US dollars with other central banks for the fixed sum of $35 per troy ounce. Admittedly, due to booming world trade, the dollar currency reserves abroad far exceeded the American gold reserves, indeed by about twice that amount. The US dollar was thus not fully backed by gold and the USA could in no way have complied with the (rarely expressed) wishes of the member states to redeem their dollar holdings for gold—until France under Charles de Gaulle did exactly that in 1968. So the system inevitably slipped into a crisis. In addition, the price of gold was under pressure and would have been valued higher in the free market (because the US dollar was accordingly considered weaker). Finally, in 1971, US President Richard Nixon gave up the exchange guarantee. It was only after the end of this system that the gold price was actually deregulated. Until then, the possession of gold had been prohibited in the USA since 1933, except as jewellery and for gold coins.

Today the USA holds a good 8,100 tonnes (and only slightly more than half of them in Fort Knox, most of the rest in Manhattan). Germany, which has retrieved a small portion of its gold from the US after heated discussions, is in second place with almost 3,400 tonnes (2017). Only China, and to a considerable degree also Russia, has significantly increased its share in the past. Little by little, the country is increasing its stocks from a stable 400 tonnes by the year 2000 to 1,658 tonnes. However, China is not buying up too quickly, even though it is the largest buyer of gold, but is rather doing so cautiously. After all, the price of gold should not be driven up unnecessarily. China has even defined specific delivery standards, so that market observers assume that London could lose its role as the traditional centre of the gold trade and be replaced by Shanghai. It would in

any case be fitting for another reason. After all, China, together with India, is the largest market for gold as jewellery. Even if these are rings, bracelets and chains, it is clear that gold as jewellery also derives its value from its material price. These developments are thus in interesting parallel with Beijing's efforts to regulate trade in cryptocurrencies.

Gold has been known, tried and tested as a store of value for thousands of years. The gold backing of currencies, on the other hand, only existed for a short time, essentially in the second half of the 19th century. Gold backing means that the central bank guarantees each holder of the relevant currency the exchange for a fixed quantity of gold. But this of course limits money supply and the national debt (a factor of stable currencies), so that among other things it was soon again abandoned. Today, therefore, no currency in the world is backed by gold—and the national debt and expansion of the money supply of many currencies is getting out of hand. In 2011, gold experienced its all-time high of $1,909 per troy ounce (31.104 grams). Since then, the price has fallen to just over $1,200 in late summer 2018.

M-Pesa

It is only a few years now that payment applications by mobile phone in Western and Asian countries first appeared on the market. In Kenya and from there in other African states, this sort of thing has been around for a long time. So since 2007—before the invention of the smartphone and apps—M-Pesa has allowed one to send money from mobile phone to mobile phone and also pay in the supermarket or in the pub, or even to grease the palms of the notoriously corrupt traffic cops. In the meantime, almost every Kenyan has an M-Pesa account, *pesa* being

Kiswahili in origin and meaning money. The decisive factor in this service, and this in particular strikes a chord with us, is that one doesn't need a bank account! Indeed, precisely because many Kenyans do not have an account or live in rural areas far away from the nearest bank is M-Pesa such a success.

In the beginning, M-Pesa served to send money from private person to private person, i.e. money home or to support relatives, and continues to do so today. The provider is Safaricom, Kenya's largest mobile phone provider, which has developed this principle together with the most important shareholder Vodacom/Vodafone (together 40 per cent). M-Pesa, like every good product/service, makes targeted use of a gap in the market and the needs of its customers: fast, uncomplicated money transfer, where otherwise the money can only be sent home physically due to lack of an account. The core of the service are thousands of "agents", often kiosk owners, by whom one deposits the money, sends it to one's M-Pesa account—and then sends it to the recipient, as simple as an SMS. The addressee then goes to another agent and gets the money paid out. Of course, the money could also remain on the mobile phone, but it is usually urgently needed and therefore immediately withdrawn and spent.

The invention is justifiably acclaimed. But as simple as transmission is—feeding money into the system is quite bureaucratic. To sign up for M-Pesa, Safaricom requires one to perform the same identification process that was completed shortly before for the corresponding SIM card, which is to say, twice. If one later deposits money into one's M-Pesa account, for example in a village shop, one have to identify oneself with the ID card or, if one are a foreigner, with a passport. Then a thick memo book is brought out, in which the name (although already known to the system and displayed on each transaction), ID or passport num-

ber (although known to the system) and the amount to be deposited are entered. Then one has to sign, and the shopkeeper transfers the money just received in cash to the phone number called in via the shopkeeper's mobile phone. So the system is neither exactly free of media discontinuity nor completely high-tech. But once the Kenyan shillings are on the phone, they can be distributed as simply as a text message.

Of course, all this is not free of charge, on the contrary. Transferring and withdrawing cost a pretty penny, while depositing is free. The fees are not exactly small—but for lack of alternatives and bank accounts, it is still by far the best option. Especially for small amounts—such as a short taxi ride—the service is unfortunately not worthwhile and can make up a quarter of the amount transferred. In the end, the driver would have to add a charge to cover the passenger's withdrawal fee. However, if one settles one's bill with companies such as the state-owned energy supplier KenyaPower or in a pub, one pays nothing for the transfer (although one are most likely charged indirectly). This function is called *Lipa na M-Pesa*, with *lipa* meaning "pay".

The service is a true cash cow for its owners, especially as the majority of Kenyans use M-Pesa. In the meantime, the amazingly simple principle has been extended under various names to other countries, such as Tanzania, South Africa, Lesotho, Fiji, Afghanistan, Romania, Albania and India, while competition with Airtel Money and T-kash by Telkom has delayed the launch of identical services. In 2017, the equivalent of €55 billion was sped through the system. According to Safaricom's own figures, it made a profit of €440 million.

In the age of the smartphone, the system has been significantly expanded. In the meantime, there are cooperations with banks, so that the M-Pesa app on the smartphone corresponds

to online banking. But the core function runs without app and account, and M-Pesa replaces bank accounts, credit and debit cards and money transfer service providers in one fell swoop. Beyond that: with the *Moneygram* transfer service, one can send amounts directly to one's M-Pesa account for negligible fees online and thus worldwide. Technically, M-Pesa also replaces cash, but in chronically cash-strapped African society, it is virtually the only viable way to access cash. M-Pesa thus naturally replaces banks, although the competition has complained that the service offers banking services without a banking licence. However, Safaricom has a special licence, and all customers are registered and have provided identification. Helpful in terms of the success was the large coverage with mobile phones—and the lack of access to traditional banking services, branches and ATMs. Out of a deficit an innovation emerged, the classic path of a new idea.

But the banking competition is also striking back in that country—and in a united fashion, to be exact. Nearly all major banks operating in Kenya have joined forces to provide an electronic and mobile money transfer service: PesaLink. Money can be sent via app and from the computer between all participating banks, but bank counters and ATMs from which transactions can be initiated are also integrated. The initiative explicitly says that it also wants to reach "unbanked people", and in the end, all 43 Kenyan banks.[112] If you look at Safaricom/M-Pesa as FinTech, however, you see the whole dilemma of the unified established banks. They came exactly ten years too late and have only reacted to pressure from the competition—well, one can hardly say "reacted" after a period of ten years.

Hardship is therefore threatening M-Pesa from a completely different side; the profit could shrink significantly in the future: in search of revenue streams for the chronically cash-strapped

state treasury, the Kenyan parliament has supported a presidential decree, issued in a chaotic session at the end of September 2018, to tax money transfers at a rate of 20 per cent, and Internet services in general at 15 per cent.[113]

Providers, most notably Safaricom with M-Pesa, are likely to recoup the money with higher fees, making services less attractive and constituting an additional cost factor for individuals and business. At the same time, this step—as painful as it is for consumers and this flagship innovation—means that alternatives will be strengthened in the long term, such as blockchain solutions, which we will present in later chapters. On the same day, September 20, 2018, Nairobi-listed Safaricom shares plummeted 6.6 per cent. The market value of the company had fallen by 70 billion Kenyan shillings at the close of the stock market, a converted value of €614 million.[114]

Local currencies and free money

The following currency should interest us above all because of its essential principle of operation. It has a central control mechanism and thus builds the bridge to our Utopicash idea, which we will present later. It contains, namely, automatic devaluation, and thus, inflation. On the surface this is a disadvantage, but of course the issuers have an objective: to spend the money quickly, to sell it to the people, to buy products and services—which is to say, to drive the economy. We are talking about local currencies, or so-called complementary currencies, which today often serve regional marketing under the name Brixton Pound and Bristol Pound (UK), BerkShares (USA), Salt Spring Dollars (Canada) or Chiemgauer, Roland or Carlo, as an element of tourism and the cohesion of local traders and tradesmen—but which

have an exciting historical background. In a way, it was a currency experiment.

Wörgl in Tyrol, the year is 1932. The small town is struggling with the consequences of the world economic crisis. Some important local factories have drastically reduced personnel, resulting in high unemployment. The town of 4,000 inhabitants is suffering from tax losses and has to finance unemployment benefits at the same time. The register is empty, hope not in sight. On the basis of Silvio Gesell's idea of free money, Mayor Michael Unterguggenberger comes up with the idea of issuing his own paper currency in order to first pay the community staff, namely with the *Wörgler Schilling*. It is linked 1:1 to the official Austrian Schilling, which in turn is deposited in the local Raiffeisen bank to cover the substitute currency. With the new money, people can now shop at local merchants and pay local taxes.

6,000 of these schillings were in circulation, and it is estimated that the actual cash cycle within the 14 months of its existence took place over 400 times.[115] Why so much and so fast? Here the permanent devaluation comes into play—which one could avoid by sheer and brisk spending of money: banknote holders had to purchase a stamp with a nominal value of one per cent each month and affix it to the banknote. This was the only way for the money to retain its validity, although the currency also had an inflation rate of twelve per cent per year. For this reason, the inhabitants also called their money "wastage money".

It worked; the project is considered successful. The local economy picked up speed again, the unemployment rate decreased, while the crisis continued. Above all, the municipality was able to restructure its finances to a reasonable extent, gener-

ate additional income, make necessary expenditures and investments and collect taxes again. And all this because the money circulation that had come to a halt before had been made to flow by the ever-present threat of loss of purchasing power. However, nobody can say whether the experiment would have worked in the long term. The Austrian National Bank stopped the action after a good year because it violated its monopoly on currency.[116]

The 30 or so local currencies in Germany do not have to fear this fate, even if they actually break the monopoly on currency and the Bundesbank, for example, takes a critical view of this type of money from an economic point of view. This is because the regional currencies have adopted the devaluation principle of the Wörgler Schilling. After all, citizens and tourists should be encouraged to spend the money again quickly. Incidentally, the current low or negative interest rates in the euro area and elsewhere have the same purpose: to make it unattractive to save something for a rainy day.

The largest local currency in the German-speaking area is the "Chiemgauer" from Prien am Chiemsee, which is accepted in the Bavarian districts of Rosenheim and Traunstein by about 600 traders and companies and is supported by an association. From a legal point of view, it is a voucher and is now also available cashless. It can be purchased at a rate of 1:1 to the euro without additional fees. However, its validity must be maintained every six months by a stamp that costs three per cent of the nominal value. There are almost 700,000 Chiemgauers in existence. The notes are numbered consecutively and have a barcode, watermark and copy protection technology and can also be tested under UV light. With 14 security features, the Chiemgau is organized in a highly professionally manner and is certainly a local economic factor.

The Bundesbank, however, sees "considerable costs for consumers, regional trade and the economy as a whole".[117] It takes a critical view of inflation (strange, given the same effect of low and negative interest rates and thus a real loss of purchasing power for the euro) and potential charges, depending on the issuer. Above all, however, it criticises economic disadvantages, mainly caused by the geographical limitations of the projects. It says in a specially written study: "With the regional compartmentalisation by local currencies, consumers and companies consciously decide against a supra-regional, efficient division of labour. The goods and services for daily needs are not supplied here by the manufacturer with the best production conditions, but always by the neighbour. What seems harmless in services, such as a visit to the hairdresser, becomes a problem when it comes to the bottle of wine, because whoever can offer the wine at the cheapest price depends not only on the winegrower's skills but also on the quality of the soil and the weather. Economists speak of 'comparative advantages' in this context. However, deliberate compartmentalisation by means of regional currencies leads to the fact that supra-regional trade is hindered, without which a region cannot develop further in accordance with its comparative advantages. The different production conditions do not take local currency areas into account, which is why consumers ultimately pay higher prices for these products."[118] Udo Reifner sees in the protagonists of this idea "a heterogeneous group. Their ideas range from a return to a romantic rural life to fighting poverty in the big city ghettos through a return to the community of fate."[119] And beyond this: "Mostly they meet together with the far more fundamental alternative ways of hermits, dropouts and adventurers. They are looking for an alternative to the current degree of socialisation and globalisation and to the Robinsonades in economics."[120]

Economist Kenneth S. Rogoff—a cash opponent and a big fan of negative interest rates, we recall—is again fascinated precisely because of the depreciation of free money.[121] After all, the idea that people do not hoard money, but repeatedly put it on the market, and thus generate sales and economic growth, is central. The father of this free money doctrine is Silvio Gesell, and his core idea was that money should only serve the economy as "a means of exchange, but it should not paralyse it as a means of hoarding".[122] A postponement of expenditure would disrupt the economic cycle, with corresponding negative effects such as price reductions by traders or loans that companies would have to take out in order to temporarily finance their ordered goods.[123] In his eyes, however, money should "correspond to nature and emulate natural things. The money in the hands of a money owner must lose its value over time, like human labour and goods."[124] In this way, pressure would be built up to no longer withhold the money, but to consume and invest it and no longer, in the worst case, speculate or even lend it for interest. He called the money *free money;* in economics it is also referred to as *circulation-secured money (depreciating money, demurrage),* because it is supposed to stabilise the circulation of money—precisely through the threat of depreciation. This, however, is an obvious contrast between free money and the aforementioned function of preserving the value of money.

In contrast to almost all other innovations and the model of 1932, today's local currency is not born out of necessity or a deficit—and thus no real added value or the role of an important alternative can be discerned. Rather, it is precisely an expression of our affluent society in which its creators long for a homeland. Of course, this also has an important function, especially in a globalised and digital financial world.

Interim conclusion

How will we make payments in ten years? Wirecard CEO Markus Braun believes that "cash registers in the current sense" will no longer exist in the foreseeable future. The shopping experience is changing fundamentally. The actual payment process is becoming more and more a secondary matter. "For me, everything we've seen in digitalisation so far is just a bridge technology to the next innovation,"[125] he says. Michael Miebach of Mastercard also sees progress in contactless payment coming soon. It will change payment behaviour in the long term. "Biometrics will play an increasingly important role in the coming years. Voice, fingerprint (and) iris are the easiest ways to make sure someone is actually the person they claim to be," he said in an interview.[126] The backlog demand—and thus the growth potential—is enormous: Only two per cent of all payments worldwide are completely digital, emphasises Markus Braun.[127]

Personal identification of the customer, regardless of a medium or data carrier, would be a step in the right direction. Because whether apps, PayPal, credit cards, cryptocurrencies or cash—in recent times apparently more means and methods of payment have been added than have been omitted. At some point, one would have to take the logical step and do without some of them! Otherwise, paying at the checkout or in the online shop will be faster, but the variety may become confusing at some point—and one may not even know where one is registered. This is another reason why it is time for revolutionary alternatives, because the means of payment installed to date are all piecemeal—as beautiful as they may work on their own. At their core are fragmented, isolated and incompatible components and devices. There are no comprehensive solutions yet

that cover many or ideally all money functions—but blockchains and biometrics are in the offing.

Policy framework, regulation and the role of central banks

The development of financial products, especially by Anglo-Saxon banks, has meant that some markets in their huge dimensions exist only on paper. This, too, has a meaningful background, but can also degenerate—this balancing act exists in almost all capitalist financial vehicles. In particular, derivatives, i.e. securities derived from another product or commodity, ensured and continue to ensure that the trading volume was and is often many times greater than the actual offer. This can happen with almost anything that is traded on the financial market: gold, currencies, pork bellies or VW shares, where enormous short sales in October 2008 drove the VW share to breathtaking heights. Speculators traded twelve to 15 per cent of VW shares, with only six per cent of them freely available. Hedge funds lost €15 billion over the course of those days. In the case of oil, however, trading on the futures market is the absolute standard. It even exceeds the real sale of black gold by a factor of 23. These contracts determine the price for a later delivery, usually in months.[128]

In addition to human greed, all this—let us not forget this as well—is and has been driven by the use of modern technologies. Only in this way has it become possible to process billions of pieces of information and transactions in the shortest possible time. Algorithms that work completely detached from human decisions do the rest by decoupling from the real economy.

Recently, for example, technical upgrades in the often unregulated trading of "binary options", a kind of forward transaction, have led some market participants to gain an advantage of milliseconds and turn this knowledge advantage into profit without creating added value. In any case, binary options are highly risky. Since July 2018, the European Securities and Markets Authority (ESMA) has therefore prohibited their marketing, distribution and sale to retail customers. Many financial products—as well as technical developments—have their justification. Exaggerations and excesses are always problematic—and above all, when people who do not have the necessary background knowledge deal with them.

Whether banks, mobile phone operators, local associations that organize local currencies, FinTechs or transfer services worth billions that earn from guest workers—the state (theoretically) watches over everything, it regulates, intervenes or reserves the right to intervene. In our eyes, cryptocurrencies are a hot candidate for necessary regulation. Wait, entrepreneurs demand regulation? Yes, and we're about to explain why.

Alongside this, the state holds the monopoly on currency and has generally delegated this task to the central banks, which in turn—more or less independently—determine monetary policy. The state or the corresponding organizations thus control the financial sector, including fiscal and budgetary policies. For its enforcement and monitoring, there are a multitude of supervisory authorities and international institutions, not to forget of course the tax offices.

Banking requires a banking licence, and as described above, some companies try to avoid this necessity by navigating by a hair's breadth with their services. Compliance with regulations costs money, as we have seen from the example of the EU Coin-

age Regulation and others. **There are money laundering regulations that must be observed, regular stress tests for banks, mandatory audits, a special auditing system for the financial sector or the obligation for issuers to have their fund prospectus formally reviewed by the competent authority.** As in hardly any other area, apart from health and aviation, the legislator has set up (rather narrow) guardrails. And it always comes up with something new, especially since the call for more supervision and restriction, whether rightly or wrongly, is constantly echoing from all sides. The subject of regulation is very ambivalent. There are areas that are overregulated and misregulated—and other fields, such as cryptocurrencies and blockchains, have no or too few containments, which is also worthy of criticism. We cannot therefore say in general terms that less regulation is better, but have to look at the area in question. Belief in currencies, especially cryptocurrencies, requires trust. And government regulation creates just that. For an adaptation, especially by companies, the current regulatory vacuum is poison! A broad application needs legal certainty.

In the USA, for example, Finance Minister Steven Mnuchin wants to turn back the regulatory wheel. One might think that the upheavals triggered by the financial crisis of 2008 and the ensuing major economic crisis would have been lesson enough. After heated debates, the Dodd-Frank Act came into force in 2010, putting banks on a tight leash. Never again should the financial institutions lead the financial world into the abyss. It is understandable that US high finance opposed this—and with Mnuchin, US President Donald Trump has appointed a former investment banker as finance minister. He worked for Goldman Sachs for 17 years, then founded a hedge fund and later took over IndyMac Bank, a mortgage bank, with a group of investors.

The Dodd-Frank Act was intended to prevent another financial crisis in which states around the world had to rescue *system-relevant banks*. Among other things, the law stipulates that banks must have an equity base of at least five per cent. Before the crisis, it was less than three per cent of the balance sheet total at many major banks. Another core element—and this is particularly painful for banks—is that they may now only carry out risky transactions on behalf of their customers, and no longer on their own account (Volcker Rule). They can no longer use the infamous credit default swaps themselves. Annual stress tests are mandatory, and in the event of a crisis, a plan must be drawn up to deal with the situation. The Financial Stability Oversight Council monitors all this.[129]

While the proponents would now even increase the necessary equity ratio, the Republicans want to take everything back. They criticise the high costs and unduly slow lending, and thus a constrained economy, although the USA is currently experiencing the longest boom in a long time, fuelled by among other things Trump's tax cuts. The Republicans want to raise the threshold above which a bank counts as system-relevant from $50 billion to $250 billion. 26 of the 39 largest banks would thus be exempted from the harsh conditions.[130] Anyone can imagine the consequences of such a measure, but the Republicans in the Senate lack the necessary two-thirds majority.

The situation in Europe is quite different, above all due to its fundamentally different social policy, as Udo Reifner notes: "The state has always intervened increasingly in market mechanisms to reduce the effects of discrimination, both since time immemorial and after the financial crisis".[131] The social critic Brodbeck, on the other hand, says: "Central banks are above all banks; they represent the common interests of the banking sys-

tem and its rule over the rest of the economy, not the needs of the general population."[132] Sabine Lautenschläger of the ECB takes a more relaxed view of the situation in the US, however: "So far the Americans have by and large only withdrawn that which went beyond international standards. Nevertheless, you have one point. It is important that large, internationally linked institutions meet the same standards, especially in trading. That is why we need the new Basel rules to be implemented in all important financial centres. In addition, it should not be forgotten that the USA has succeeded in quickly returning to a path of growth. Of course, this also helped the American banking system a great deal. We were a lot slower there, even tackling the structural problems."[133]

Monetary policy

Perhaps the most important element of central banks and thus of the ECB is the interest rate policy, which determines the money supply of banks and the price of loans—and on the other hand influences investment opportunities. This is followed by a real domino effect: because depositors, for example, no longer get anything for their money or even have to fork out negative interest rates, they look for ways out, investing more of their money in real estate and thus driving up rents. At the same time, low interest rates make it possible for countries to borrow more, and some countries—depending on their rating—even have to repay less money than they have received. If interest rates turn, a high level of new debt will pay off. Incidentally, one of the largest and most chronic debtors worldwide is the USA, which has accumulated debts of $21.3 trillion (July 2018, with a tendency towards increase), 105 per cent of economic power,

and thus more than ten times as much as Germany, with barely €2 trillion. In Germany, the current interest rate policy facilitates the deleveraging of the federal government, federal states and municipalities. In contrast, Deutsche Rentenversicherung (German Pension Insurance) is even required to pay penalty interest for policyholders' funds that they park in banks, and private health insurance companies are at loss as to what they should best do with their customers' reserves. Money is therefore extremely cheap, which can be seen with mixed feelings, and is also partly responsible for the current banking crisis, because in many areas, financial institutions hardly earn anything. On the other hand, the economy receives strong support in the form of cheap loans.

However, Brodbeck sees limits to monetary policy. "Central banks can issue money and make it available to the banking system through loans. But where these loans flow into and by what multiplication they have an effect is just as uncontrollable as the fraudulent manoeuvres of greed on the markets. Central bank loans, which were almost free of charge, served and continue to serve above all the need for speculation, which moved exchange rates and prices—now in almost all markets. Since greed is endless and therefore always grows faster than the monetary influx in these snowball systems, this insanity periodically collapses. Here, the rule of money reveals itself unflatteringly, taking politics hostage and leaving the hopes of democracies for regulation running into the void again and again."[134]

With its monetary policy, the ECB naturally influences the resilience of the euro. Still, those who take a critical view of ECB President Mario Draghi's interest rate policy should be told that low interest rates are not a speciality of the euro. They existed in other countries long before that. Interest rates have fallen in al-

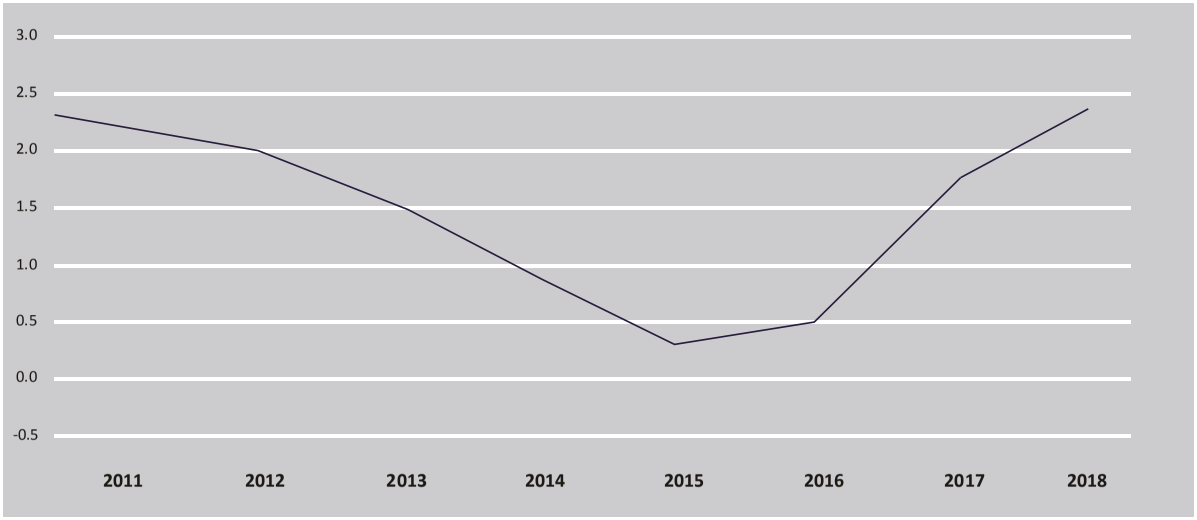
most all OECD countries since the 1990s.[135] The Japanese central bank lowered the interest rate significantly from 1995 onwards, and from 1999 it was almost zero per cent.[136] After the bursting of the dot-com bubble at the turn of the millennium and the terrorist attacks of 11 September 2001, the Fed depressed interest rates—and thus contributed to the later real estate crisis. Denmark lowered the deposit rate for banks to -0.20 per cent in 2012. Negative interest, then. Only in 2014 did the ECB follow, and Switzerland, Sweden and Japan also know or knew penalty interest rates.

Above all, however, the ECB's bond purchase programme was controversial. An end has been determined, but it is only slowly coming to an end.

Inflation

Indeed, it has long been reassuring that, given zero and minus interest rates, inflation in the EU area has been very low to non-existent. It was indeed a result which Mario Draghi explicitly claimed for himself and his interest rate policy. After all, a glut of money tends to lead to rising prices. At the end of 2016, however, the tide suddenly turned, a trend which continued throughout 2017: indicators showed a 1.5 per cent currency devaluation at the end of the year. In May 2018, the inflation rate in Germany—a country with a historically high fear of inflation—even reached the preliminary peak of 2.2 per cent. This was likewise higher than in the euro area. Money is losing even more value in people's minds: as a recent study by the Dutch Central Bank has determined, newspaper readers are more mistaken when it comes to estimating the inflation rate than people who do not read the paper.[137] This applies to a minimal extent to

Inflation rate Germany
2011 - November 2018



Source: http://www.inflationsrate.com

so-called quality newspapers, but it is even worse when it comes to the consumption of tabloid and regional daily newspapers. In any case, we hope that you will be able to raise your level of knowledge with this book—and we have also delivered the rate of price increase free of charge.

Regulation for FinTechs

It is obvious that FinTechs will also have to address the issue of regulation. The authorities are also closely monitoring FinTech's developments. "The field of technological financial innovations (FinTechs) is growing dynamically. So far, FinTechs have played a rather minor role in most market segments of the financial system. However, they should become noticeably more important in the coming years. Early macro-prudential monitoring therefore seems advisable," said the Bundesbank for example in its latest report on financial market stability. The decisive factor is the area in which they operate and the services they offer their customers. However, depending on the business model—and often it is designed in exactly this manner—they may operate outside regulation. Supervisors, which often include central banks, have been pushing for a number of years to further develop the regulatory framework. Furthermore, in 2017, the Financial Stability Board (FSB), on behalf of the G20, published a report on regulatory issues in the FinTech sector. The conclusions of this study were widely supported by the heads of state and government at the 2017 G20 Summit in Hamburg, from which a mandate for action for the G20 is derived.[138] Three key areas for international cooperation between the supervisory authorities were identified in the report:

- "It should be examined whether the regulatory framework is appropriate with regard to operational risks arising in the financial sector from services provided by third parties, some of them cross-border, such as cloud computing.
- Equally important is an internationally coordinated approach to cyber-risks. This includes drawing up contingency plans, exchanging information and monitoring risks on an ongoing basis.
- In addition, the FSB encourages the monitoring of macro-financial risks that may arise from FinTech activities. In this respect, national authorities should strengthen their human and technical analysis capacities and improve the data basis for adequate monitoring."[139]

In addition, according to the FSB—which only by coincidence has the same abbreviation as the Russian domestic intelligence service—the supervisory authorities should pay attention to cross-border lending, trade and payment traffic and "make swift adjustments".[140] The FSB is particularly interested in smart contracts and "other applications based on distributed ledger technology that have hitherto been subject to a high degree of legal uncertainty".[141] This is not surprising since, to put it simply, the term "distributed ledger" refers to the subject of blockchain, i.e. "networked computers that come to an agreement (consensus) on the order of certain transactions and that these transactions update data".[142] This technology is essential for the decentralized management of data on the Internet. Without becoming concrete, the International Financial Stability Council also mentioned digital currencies as a field of action. The development there should be monitored further, also on the basis of "further

analyses" in which "the effects of digital currencies on monetary policy, financial stability or the global monetary system" are examined.[143]

The supervisory authorities are aware of the wise division of labour between older and younger companies, as the example of Germany once again makes clear. The Bundesbank also states in its Financial Stability Report: "Numerous FinTech companies in Germany work closely with licensed credit, financial services and payment institutions. FinTech companies provide the technology, while the institutes take over the business subject to licensing (so-called "white label banking"....) Often FinTech companies do not themselves conduct business subject to licensing."[144]

We told you so: regulation and deregulation are equally necessary. Fortunately, there are also simplifications. In 2017, for example, it was "non-banks" that gained much easier access to the payment services market through the *EU Payment Services Regulation*. And elsewhere, regulation achieves what the business community in particular wants: binding and, above all, uniform rules that everyone must adhere to. This is particularly necessary for new technologies and phenomena. Among other things, the *Second Payment Services Directive* created rules for payment initiation services which initiate payments on behalf of their customers without managing their account.[145] This also covers Internet and mobile payment methods. The Bundesbank welcomed this and regards regulation as an economic factor: "The now clearly regulated legal situation could lead to additional offers of payment initiation services and thus to further growth in the aforementioned payment instruments".[146]

Supervisor Sabine Lautenschläger is naturally worried about an "imminent deregulation", also in Europe.[147] She sees a counter-movement in current proposals for European legislative

changes. We have to take care that the pendulum does not swing back to this position again.[148] She sees indications of this in the Capital Requirements Directives, where it could become more difficult for supervisors to demand more capital for certain risks. As a result, their instruments would be weakened.[149]

But Lautenschläger needn't worry about her future. Where orders are omitted or become easier, a regulation immediately makes a reappearance. Finally, supervisory authorities must permanently prove their *raison d'être:* in the future, financial service providers and above all banks will be obliged by the guidelines for more transparency (MiFID) to disclose what hidden commissions they collect for their investment products.

Interim conclusion

The regulatory situation appears to be twofold. Europe seems to have learned a lesson. But here, too, maintaining status—as in other policy areas—is an eternal struggle. Lautenschläger, how could it be any different in her function, naturally pleads for strict supervision: "Strict supervision ensures strong banks. The resilience of institutions increases when supervisors demand adequate capital for risk and insist on sufficient liquidity and better risk management."[150]

The situation is different in the USA, the home of high finance. Here the arguments are fiercer, fighting is at an even greater no-holds-barred level, and with other auspices, particularly since the financial industry there represents a substantially larger economic factor and particularly an enormously influential lobbying potency. America wants to defend its status as a global power on this front as well, not least with the US dollar as the world's leading currency. Other financial locations are al-

ways in the starting blocks. In Europe, Brexit is reshuffling the cards. No matter what the political solutions and actual developments are: London will lose and portions will be given above all to Paris, Frankfurt or Dublin. Seen globally, Singapore and increasingly Shanghai (see also the gold market) are actors that consistently have to be considered.

Would a Lehman-style crisis still be possible today? Lautenschläger replied to *DIE WELT*: "You will never hear me say that there will never be another crisis. But certainly institutes and supervisors are better prepared today. Banks hold much more capital and liquidity. Risk management and corporate management are also better, although not yet good enough in every institution."[151] And she continues: "Don't worry: we're tough. Our job as supervisors is not to prevent market exits. To be clear, we are not here to ensure the survival of any bank. We are here to react to risks at an early stage. And also to recognise when a bank is actually no longer viable and has to be liquidated."[152]

Customer needs

Space, time and equipment play an increasingly minor role in money transactions. Today we can conduct our financial transactions from any place that has Internet and electricity; and it is an integral part of the development that we also deal with this matter ourselves; in fact, we have to deal with it. No one types our handwritten bank transfer into a system anymore or fills in the annual interest of our bank book by hand or by pushing it into a printer (apart from the fact that this interest no longer exists). We conduct the majority of our financial transactions ourselves on laptops and by app. Such nationwide and person-

nel-intensive services would no longer be affordable, and this development has led to a thinning out of personnel in the branches and head offices. We are therefore no longer dependent on the opening hours of the branches and can pay for our supermarket purchases with "mobile phone tap", smartwatches or even just a chip on our key ring.

Nevertheless, there are extensive service and call centres that can be reached around the clock. Not all money matters can be automated; there are always open questions or new topics, or we simply don't know where to press the right button on the screen. As explained in the banking chapter, it will not be possible to imagine everyday service without people in the foreseeable future; after all, this is the only way to establish the necessary trust. (We will see later in the blockchains that absolute reliability will no longer require the paradigm of trust there. This consensus system is then "trustless".)

Depending on society and market, however, there are different conditions and needs. In large cities in Africa, for example, there is still a good density of branches with a good number of staff, as customers prefer this; even collecting money personally for a fee rather than going to the bank machine. As always, the customer decides if the critical mass is there for certain services and whether it is worthwhile. In our latitudes, essential services of old have been completely outsourced to the customer. In these parts, there is hardly any choice left, as business and private customers are demanding efficient, cost-reducing, time-saving and practical solutions.

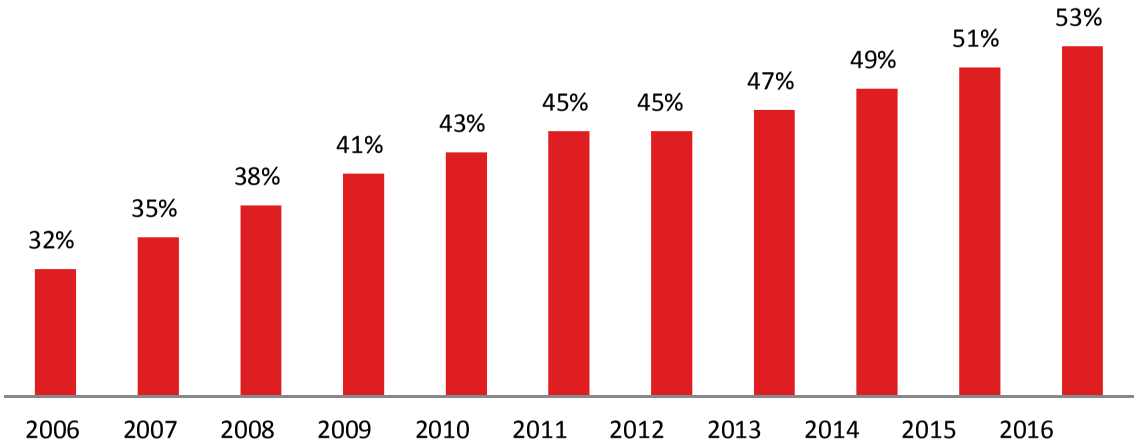
Only modern communication technology has made all this possible, and in some ways this "need to do it oneself" also means great autonomy and independence for each individual in financial matters. We are used to booking our own flights and

ordering mobile phones online from China. We are mobile, we want to be flexible, everything has to happen quickly and immediately, so that these needs additionally and especially extend to financial services. And therefore an important point for companies and providers is the catchy design of user interfaces and consistent user-friendliness. Everything must be readily comprehensible and easy to operate. Otherwise the customer jumps ship—or even has to call the call centre. "Above all, the customer wants banking services to suit his mobile, digital life and to be simple and noiseless. Counter opening times don't fit in there," writes Miriam Wohlfahrt, founder and managing director of the payment provider RatePAY, in the business magazine *Bilanz*.[153] Customers and their needs are the actual drivers of such innovations. After all, they want to be more flexible, consume more conveniently and make quick decisions.

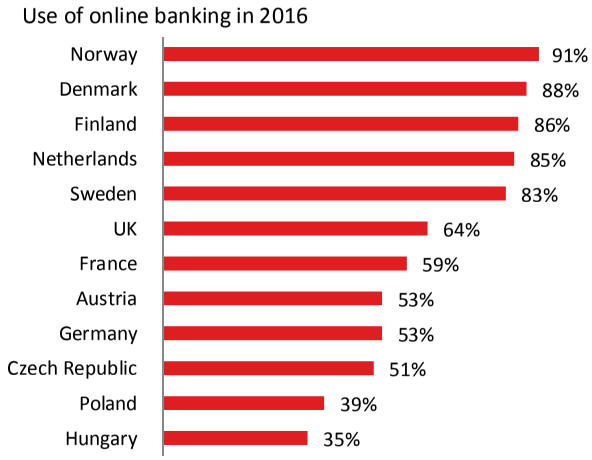
In online banking—driven by the emergence of mobile devices in the last decade—Scandinavian countries are particularly ahead. 80 per cent of bank customers there make use of such an offer; in Eastern European countries, the proportion is the lowest. In the field of mobile banking, Anglo-Saxon countries are on the other hand most active.[154]

And in all of that, FinTechs come into play. This is because their offerings are Internet-based and application-oriented. For example, management consultancy GBC succinctly wrote in a study: "FinTechs aim to increase customer value through benefits such as ease of use, efficiency, transparency or automation. So far, traditional banks have often not exhausted these potentials."[155] Banks' challengers are simply responding to "rapidly changing customer expectations and behaviours," according to EY. In turn, banks are being forced to upgrade technologically "to avoid customer losses and preserve their value chain."[156]

Share of online banking users in Germany



Source: GBC, Eurostat



Source: Eurostat

Source: ING DiBa

EY has even developed a "FinTech Adoption Index", which states that "consumers are interested in FinTech services because the products are "simpler, more convenient, more transparent and easier to customise.[157]

Consequences and disadvantages—an interim assessment

We are on the threshold of a new financial order. The upheaval is massive and has been going on for two decades, at the latest with the advent of the Internet and online banks. Nevertheless, the fundamental condition of the market has so far not changed—until now.

Almost all money matters still run through an account at some point. Banks are cumbersome and function too much in established structures. Procedures and processes, especially involving the central point of payment services and means of payment, mean an incredibly high waste of resources and destruction of value, for example, if we consider the cost structures and fees.

Monetary policy is not sustainable. It is one-sided and—much as we sympathise—too focused on the needs of the financial sector. The clear disadvantages, such as the low interest rate policy for savers and life insurers, are simply ignored by those responsible and politicians. These are short-sighted activities, i.e. everything else is sustainable and partly toxic and purely political. And also the characteristics of those classic currencies that exist in every single country of the world, the unbacked fiat currencies, are doubtful and in our eyes not future-proof.

The up-and-coming FinTechs are in the process of upsetting the "economic" part of the market. But for the political and so-

cio-political part, we need a counter-model and a completely different functional principle—but one that the state must accept and basically (in concert) operate. We will explain this in detail in the second part of the book. The development of technology relevant to financial services is progressing rapidly. Central to this is blockchain—and this principle will not only change services, but can also revolutionise the management of entire states with all its components, such as tax, social assistance, health care, permits, property, land registers and much more.

Modern technologies enable convergence and the merging of now fragmented aspects. The development of recent years has paradoxically frayed the use of services: asset classes, financial services, insurance, means of payment and products are fragmented, making the overall system all the more inefficient and cost-intensive.

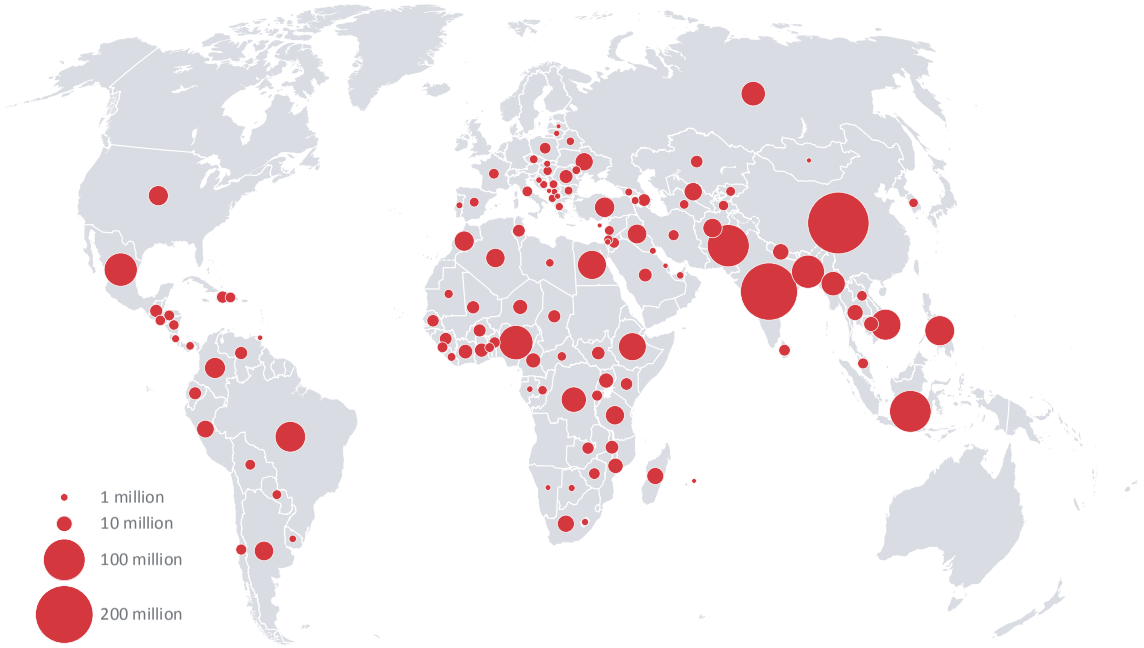
But the biggest disadvantage of the current financial order has not yet been mentioned—and for this we have to move away from our comfortable Western Divan: 1.7 billion people had no bank account at all in 2017—that is 31 per cent of the world's adult population.[158] Huge groups and entire regions, especially in Asia, Africa and Latin America, and in some cases Eastern Europe, are excluded from the official financial system. Extrapolated across Europe, this represents 8.6 per cent of adults, while in the UK and Germany almost 100 per cent of people have access to an account.

The consequences are massive. Unless one uses alternatives, "no bank account" means no or only limited access to:

- a secure repository for one's assets
- loans
- savings books/accounts

Globally, 1.7 billion adults lack an account

Adults without an account, 2017



Source: Global Findex database.
Note: Data are not displayed for economies where the share of adults without an account is 5 percent or less.

- insurance
- investment products
- simple means of payment
- international markets

The consequences for the quality of life and prosperity of those affected are palpable. At the same time, such conditions cement social and economic inequality. "Wealth is participation, inclusion, cooperation, poverty and exclusion," says Udo Reifner.[159] He continues: "In addition to the lack of money for the poor, there is also the lack of creditworthiness and exclusion from payment transactions. Without bank accounts, cards and creditworthiness that even temporarily deny one the use of money."[160] This undoubtedly means "a kind of barrier to entry into the market that every society shares."[161] In this case, it is a case of division between regions and whole continents. From a purely technical and superficial point of view, 1.7 billion people are excluded due to the lack of access to an account—but this is only because an account is still the key to participation in financial transactions in most countries today. An important point of the solution will be that an account will no longer play this existential role. M-Pesa, bitcoin and their copycats are showing the way.

2. SOLUTIONS

Drivers, forces, inclusion—and the power of disruption

Contactless payment at the point of sale, real-time payment processing, smartphones for trading in cryptocurrencies and virtual goods—all these amenities are enjoyed by private and business end customers thanks to advancing digitalisation and its partial elements, such as mobile radio, Internet, networking, data acquisition and evaluation and modern systems and end devices. And this, as mentioned, without spatial and temporal restrictions. "The new technologies simplify access to information as the basis for decisions, reduce costs and increase reaction speed," says the Bundesbank.[162]

Of course, this progress and these precursors of digitalisation have existed for decades, especially in the IT systems of banks and in the business-to-business sector. On the other hand, the combination of communications technology and mobile terminals with financial services of all kinds has taken quite some time from the consumer's point of view. But now this trend is advancing—driven with full force by FinTechs. All these innovations, apps and the driving forces and key elements discussed in more detail in this section will fundamentally change the finan-

cial sector, wiping out professions and services and creating new ones. Just as Joseph Alois Schumpeter surmised with his creative destruction.

Banks are only one sector—the forces of change are universal and apply to all enterprises. The problems of banks are not only of a financial nature. On the contrary, parallels to major bankruptcies and crashes of global corporations or entire industries, which overslept technological upheavals or simply did not recognise them, are literally inescapable. "As in Kodak's case, neither age, size, reputation nor current sales figures can guarantee that a company will still be able to compete in the market tomorrow," writes Salim Ismail in his superb book *Exponential Organizations*. And so the driving factors are not financial in nature, but are representative of developments in so many industries, from shrinking mobile phone companies to manufacturers of 35mm films. The latter is actually a victim of digitalisation, because the product is no longer needed to this extent today. The former, Nokia, was itself a driver of digitalisation, but then set the wrong course.

In addition to technology, industries and companies are naturally influenced by many other aspects that determine their weal and woe, and especially their management decisions. Included here is the organizational form. This is not intended to be a business management book, but we would like to briefly pick up on the idea of Salim Ismail and his *Exponential Organizations*. After all, market-ready top products do not fall from the sky and scientific findings are not automatically transferred into functioning devices and systems. Rather, the appropriate form is needed, and for Salim Ismail the "exponential organization" is best. His first point of criticism is: "Pharmaceutical companies, aerospace companies, automobile manufacturers and energy

companies repeatedly make investments whose results they will only know in many years' time. This is a functioning system, but not an optimal one. Too much money and too many valuable talents are put into decades of projects whose chances of success are hardly measured until they finally fail.... This is an intolerable and unacceptable situation...."[163] From his perspective, we simply need to find better ways for the organization: "We've learned how to scale the technology; now it's time to learn how to scale our organizations. This new age calls for a different approach to building a new economy, improving performance indicators and solving the challenges ahead."[164] For him, these solutions are exponential organizations.

The background to this is the extremely rapid development of technologies of all kinds, coupled with comprehensive networking, data processing and sophisticated and often self-learning algorithms. From this mixture, which accelerates everything once again, innovations and oft-cited disruptive changes emerge—and the success in doing so determines the existence of the company, at an unprecedented pace and in almost all, even and especially in traditional industries. Ismail notes that "in history, disruptive breakthroughs occurred whenever separate fields overlapped.... Today we basically connect all innovative areas."[165] One of the entrepreneurial mistakes in not recognising and shaping this dynamic is that we continue to assume linear changes instead of exponential ones. Another shortcoming is often not understanding the power and importance of information and data. "An environment supported by information offers fundamentally disruptive possibilities,"[166] says Ismail, who immediately draws the watershed between linear and exponential thinking. Change, even rapid change, has always existed. Especially since the Industrial Revolution, our lives, jobs and entire industries

have undergone fundamental changes over the past two centuries. Knowledge of the fact is important, but also a trap: "Automation, mass production, robotics and even computer visualisation have changed the slope of this line, but it remains linear."[167] Because: "If you think linearly, if your operational processes are linear in their measurement of performance and success, then the result will be a linear organization that looks at the world from a linear perspective—as the innovative technology group Nokia itself did.[168] With the known consequences. After all, only old-school organizational structures and ways of thinking, planning processes and proceedings can result from this.[169] As if it were a field study on banks, says management author John Hagel: "Our organizations are structured to withstand change from outside."[170] Even if these changes are useful, they are rarely used.

It is exactly the same in the established financial industry. They in particular have the means, the size and the market power to drive these massive changes forward—but not the approach and the necessary philosophy. They would prefer to grow in a more classic manner, for example through mergers or acquisitions, and this is what is currently happening at the interface with FinTechs. This gives them the flexibility and speed they don't have themselves. We have experienced the fossilisations and rigidities of established financial institutions in our own careers and have described them in the banking section. Ismail confirms our findings scientifically and in a generalised way: "Fast or disruptive change is extremely difficult for large companies with a matrix structure. In fact, those who have tried have found that the organization's 'immune system' probably responds to the perceived danger with attack."[171] As we have experienced, such an allegedly efficient approach is intended to

reduce risk and maintain planning security. In the medium and long term, it will lead to the end of the company—and since the world is turning much faster today, possibly even in the short term. After all, entrepreneurship means taking risks. Without this risk—with a lot of trial and error, experimentation, failure and continuous improvement—there is no economic success and no groundbreaking innovation. Disruptive innovations rarely come out of the status quo (Clayton Christensen)—and it is no coincidence that the above chapter outlining today's banking landscape is called "Status quo".

Technologies are the drivers of change. And among the exponentially growing technologies Ismail counts among other things the "unlimited computing power of computers, sensors, networks, artificial intelligence, robotics, digital production, synthetic biology, digital medicine, nanotechnology".[172] He defines the object of his consideration as follows: "An exponential organization is an organization whose impact (or return) is disproportionately high—at least ten times higher—than in comparable organizations. The reason for this is the application of new organizational methods…."[173] The term exponential organizations deliberately includes non-business entities, such as government, government agencies, or non-profit organizations. The core and starting point is the mastery or generation of exponential growth, usually in technology areas, according to Moore's Law of doubling the computing power of integrated circuits; a phenomenon that can also be transferred to other information technologies.

This phenomenon is driven by information: "As soon as an area, discipline, technology or industry is based on information and controlled by information flow, we see a doubling of performance every year".[174] Once this process of doubling has got un-

der way, it no longer stops. It accelerates by itself—caused by once manufactured devices and systems. All this can be observed in areas such as artificial intelligence, robotics, biotechnology, bioinformatics, medicine and many more.[175] In his view, an exponential organization is best able to "do justice to the accelerating, non-linear, Internet-driven speed of modern life."[176] Everything works towards or is there to achieve the Massive Transformative Purpose (MTP)—the overarching, goal-oriented meaning of the organization."[177] The mixture of these elements separates the wheat from the chaff, because many upheavals are massive, but not transformative. [178]

Ismail has analysed certain properties that exponential organizations have. (All need not be simultaneously present.) This includes:

- employees as required
- the existence of a community and a broader crowd
- the use of algorithms
- leveraged assets (used assets)
- and commitment[179]

These core elements are summarised under SCALE: *Staff on Demand, Community/Crowd, Algorithms, Leveraged Assets* and *Engagement*. Ismail has also identified nine key dynamics of exponential organizations—the use of which companies desiring success should consider:

- "Information accelerates everything"
- The drive for de-monetarisation
- Disruption is the new norm
- Beware of the "experts"

- Death to the five-year plan
- Smaller packs a bigger punch (or: Size is important, but not the way you think)
- Rent, do not own
- Trust is better than control, and open is better than closed
- Everything is measurable, and everything is knowledgeable"[180]

At this point, we would like to provide a view of upcoming passages about blockchain: these once again promote Ismailian thoughts, or are the perfect platform for their realisation. Many of the elements of the exponential organizations just described are an integral part of blockchain, and are intrinsic to it.

Digitalisation

Today, digitalisation is an integral part of any statement about social and economic developments. Digitalisation is a buzzword and at the same time the basis for profound changes in the organizational form of almost all aspects of our practical life. In the overall context, digitalisation is one of the four global megatrends, i.e. the phenomena that fundamentally shape most societies: urbanisation, mobility and demography are also part of this, and often all or several of them work together.

Digitalisation, on the other hand, and we have already touched on these aspects, consists of several central partial elements. For the purpose of our book, the Internet, mobile devices, the evaluation and use of data and blockchain are particularly important. There is not much to be said about the Internet and mobile de-

vices, so we want to look at the last two points. It is important here to see digitalisation not only in terms of the end product or the service provided to the customer. Progress in this area is evident in all stages and processes and in the working culture of a company, including recruitment and leadership, marketing and PR, day-to-day and strategic organization, research and development, product creation, project management, communication with customers, and even how they encounter or ultimately use the product and service.

Data

All elements of digitalisation are significant. But because they so comprehensively shape the technologies of today and the concerns of this book, we want to briefly address the outstanding role of data and algorithms. The enormous—and constantly growing—amount of data, its linking and analysis, coupled with the use of algorithms for practical application, make this element a cornerstone of any sustainable organization. Conversely, this means that if organizations do not control the collection and evaluation of data and do not transfer the processes gained from it into practice, there is a high risk of being left behind by competition.

The central role of data and information has therefore long since led to significant catchwords such as "data is the new gold" or "raw material of the 21st century". Salim Ismail says: "Information is the most precious commodity. More reliable than any other asset, information has the potential to double regularly. Instead of simply buying more and more assets, the key to success is to find access to valuable repositories of existing information."[181]

It is estimated that mankind only uses around twelve per cent of the available data volume.[182] "Progress" is particularly dependent on three factors: *Volume, Velocity* and *Variety*—the "three V's" of big data. Between 2000 and 2002 alone, humanity collected more data than in the 40,000 years before.[183] The data available on the Internet today is more than 1.9 zetabytes (over 2 trillion gigabytes). The total *data volume* available is growing by around 50 per cent annually. On Facebook alone, ten million pictures are uploaded every hour. The main drivers are the use of mobile devices and the mobile use of data. In 2013, their volume was already 18 times that of total Internet use in 2000.[184] Today, more than 4.5 billion people are members of social networks. In Germany, more than every second person owns a smartphone. Almost every step in real life today is associated with a digital action. Experts estimate that the data volume will continue to increase drastically, especially with the new electronic and digital payment methods. It is estimated that around 50 billion technical devices will be networked by 2020.

The basic prerequisite for being able to evaluate these exploding amounts of data is the dramatically higher speed (velocity) of data processing and the possibilities of cost-efficient data storage. The aforementioned Moore's Law predicts that the computing speed and memory sizes will double every two years.[185]

Data is part of our digital infrastructure, but also a commodity. There is the organic creation of data, for our everyday life, for the administration, for the functioning of our society and customer relations. In addition, companies like Alphabet (the holding company of Google) to Zalando all the way back to Amazon have an irrepressible data collection frenzy, by means of which it is not only known that I bought myself a travel guide on the

USA, but also that I bought it alongside a slang dictionary for New York—and this is known to other consumers, albeit anonymously in the case of Amazon.

With the technical possibilities, the economic potential of so-called Big Data, or rather Smart Data, which is generated from the billions of raw data of Big Data, is also increasing. Global sales in 2017 were around $33.5 billion, depending on the perspective and study, and are expected to reach more than $92 billion by 2026.[186] This makes Big Data one of the fastest-growing segments of the IT market.

Our daily lives are paved with data streams. With the alarm ringing of our smartphone alone, we generate data. As early as 2010, *The Wall Street Journal* found in an elaborate study of the 50 most popular websites, "that all but Wikipedia (...) transfer the data of their users to third parties. 37 of the 50 most popular websites sent information to over 30 third parties with every click, 22 of them even to over 60 third parties."[187]

One of the largest data growth markets is the healthcare sector—but Germany is completely behind in this area: the US insurance company Aviva deals with the prognosis of risks for diseases such as diabetes, high blood pressure or depression solely from data on consumer behaviour, lifestyle or income.[188] However, the business models of the American Internet giants Amazon, Facebook and Google are particularly prototypical for the data collection frenzy. As described above, Amazon collects enormous amounts of data, searches it for samples, decodes individual purchasing behaviour and derives purchase recommendations and plans for its inventories from this. The more content Internet users enter into the Net, the more precisely their consumer behaviour, wishes and personal inclinations can be documented and profitably exploited. "Facebook tells me who

I am. Amazon tells me what I want. Google tells me what I think (George Dyson)".[189]

The characteristics of today's data—and at the same time also a prerequisite for meaningful use—are that they are digitised and can be read, captured and stored by IT systems. This is the only way to preserve their practical benefits, because they can be exchanged quickly and efficiently—in view of the billions involved. The breathtaking rise of companies such as Google, Facebook or Amazon, which would be nothing without data, has given us an idea of how much data shapes companies as a central medium, commodity, source of knowledge, currency and critical success factor. Of the three companies, Amazon is the one that exists most solidly in the real economy, i.e. the all-encompassing trade in goods. This success is however made possible by the clever collection, linking and evaluation of data, coupled with the massive deployment of algorithms. Amazon is therefore by nature not a retailer, but an IT company. Amazon knows what your interests are and makes purchase suggestions. Indeed, Amazon even knows more and sometimes earlier than you yourself. This is so because the billionfold connection with the searching and buying behaviour of others allows phenomenal parallels and conclusions to be drawn. In addition, the entire logistics of Amazon, with its gigantic high-bay warehouses spread all over the world, is also inconceivable without data processing. On top of that, Amazon went long unnoticed and, with its subsidiary and cash cow *AWS,* has gone on to become the world's largest cloud provider. Unlike many other companies in the industry, Amazon only uses the data from online trading for its own purposes—and converts it into breathtaking growth rates and increasing market shares. We as authors of books know this from repeated painful experience. Amazon is a great

place to sell books, but as an author or publisher, one doesn't get any information about your buyers and readers, or even about which websites led them to Amazon. One only learns on which day someone bought a book at what price, but this happens almost in real time.

Google, on the other hand, seems to consist almost exclusively of data, even though Internet giants are increasingly relying on the "Internet of Things" and buying up companies there. Google is a true data octopus, symbolised best by the search engine so central to the business. Why Google is so successful is best illustrated here. All search queries via Google—and in Western Europe the market share is around 95 per cent—are recorded, stored, evaluated, linked and practically implemented so that customers always receive the best and most relevant result for their search queries. Google takes care of every aspect, no matter how small. The core of this is, of course, the Internet pages of the respective providers. Here, a vast number of facets are analysed—again and again: how the site is structured, the style of the language, whether it is kept up-to-date, how many links lead there and from whom? How many people visit the site, which pages do they access, how long do they stay there and from which page do they jump to which page, and in what amount of time are they gone again (bounce rate)? And so it goes on: all possible properties, aspects and parameters are structured, captured, mixed and pressed into those fabulous algorithms that website operators and search engine optimisers would so like to experience. All of this is constantly being refined—because IT experts around the world are adapting to it, and because there have been manipulations, especially in the past, with Google however putting a stop to them through various updates. And no matter how many elements there are in this equation, in the end Google pro-

duces a simple search result for the respective search query, with a ranking of 1 to 10. But behind this is a billion-dollar effort, above all also research effort, especially for the creation of the sophisticated algorithms with that oh-so-mysterious Google formula, which takes about 200 factors into account.

Incidentally, Google's research and development efforts may well be legendary—but Amazon spends even more, namely seven per cent of its turnover. And a decisive topic here is data, also in other companies. "We think that most successful new businesses in the next few years will either build their business on new information sources or by converting previously analogue environments to information," says Ismail.[190] By combining large amounts of data with powerful new analysis tools, it is possible to see the world with new eyes—and turn the resulting information into new business opportunities," he continues.[191] For Ismail, there are two basic forces that define exponential organizations: "The first basic force is that an aspect of the company's product is made possible by information.... The second basic force is that the fluid nature of information places important business functions outside the organization—to users, fans, partners or the general public."[192]

Blockchain, cryptocurrencies and smart contracts

The high art of using data and algorithms in the financial world, these are cryptocurrencies, which in turn are based on blockchain technology. In this chapter, we will present both of these in context and will also discuss smart contracts in particular.

In the future, money will not only be transported and stored via data streams, but data will simply constitute money. Crypto-

currencies consist exclusively of data. Crypto-expert Shermin Voshmgir even says: "Cryptocurrencies are programmable money."[193] So what once was and still is the mint and the money printing works, where the money creation of the central bank finds its practical expression, is the *mining of* cryptocurrencies. In the case of public cryptocurrencies, the person executing the mining also receives remuneration for this—a completely new and almost bizarre situation in the history of money, in which one can generate an established/already existing currency and use it legally. In the case of bitcoin, of course, this is bought with an absurdly high power consumption, so that the increasingly complex and expensive mining is only worthwhile in countries with very low power rates. The cryptocurrency must also be obtained with great effort because its quantity is limited and the process of creating new units is finite. The "miners" are therefore facing increasingly fierce competition. With bitcoins, the issue volume is limited to 21 million units, with more than 17 million units already in circulation in July 2018. To keep the bitcoin system running alone, 130 terawatt hours are required, which corresponds to a quarter of Germany's annual consumption.

Although bitcoin is the most prominent representative, it is by no means the first cryptocurrency. But the forerunners—such as those from DigiCash Inc. 1990—probably appeared too early. Clearly, the time was not yet ripe. The inventor of bitcoin—whoever it was—borrowed many elements from them. Ethereum is the second largest blockchain and works in a completely different manner. In addition, it enables broad areas of application and smart contracts, which we will get to shortly; unlike bitcoin, which is only suitable for sending money.

Cryptocurrencies are on everybody's lips; in the broad mass of people, mainly as a subject of conversation and object of spec-

ulation. Some are vexed with themselves about missed opportunities with the increase in value, others puzzle about the principle of function; after all, the central word element is not by happenstance "crypto". But very few of them have used cryptocurrencies as what they are intended, as a means of payment. Bitcoin, Ethereum and EOS are anything but merely a fashionable topic, but will fundamentally change the way companies do business and communicate with one another. At the beginning of last year alone, 90 central banks worldwide were therefore working on the development of digital currencies—and this is mainly due to the revolutionary idea behind cryptocurrencies, which was completely marginalised by the hype: blockchain technology, which drastically simplifies and makes more reliable business transactions of all kinds.

Through blockchain—and this feature is significant for our book—even strangers can do business with each other. Trust is then no longer necessary, which is the talk of it being "trustless". The processes no longer run via a single processing centre. Rather, the central function of "accounting" is entrusted to independent computers. The validity of transactions of any kind—payment transactions, exchange of information, even real estate transactions—is checked and confirmed decentrally by a large number of computers. In the case of pure cryptocurrencies, for example, community members receive a small amount of the underlying currency for their activities. *Minting* is the most modern form of *mining*, i.e. the creation of units of a cryptocurrency by the members. It is precisely the help of the individual—namely the authentication of blocks—that drives the system, indeed makes it possible in the first place. They receive remuneration for this.

The University of Vienna has the first institute of its kind in this field, the Institute of Cryptoeconomics. The head of this

institution is Shermin Voshmgir. She has this to say about the advantages, here using the example of bitcoin: "There is no single legal entity that could be held responsible for bitcoin. All the rules for the transactions are in the code. The code is transparent. Anyone who has a computer can download the code and join the network. And there are different actors who have different roles and get incentives from the rules of the game that are in the code."[194]

A *blockchain* is an "endless chain of digitally connected ledgers".[195] Each transaction is registered in the systems and is completely transparent and visible. The data is encrypted and forgery-proof. The massive use of cryptocurrencies—including governmental ones—would significantly simplify and cheapen money transactions, especially because banks and other financial intermediaries would no longer be needed. American business journalists Michael Casey and Paul Vigna see bitcoin as "a groundbreaking digital technology that can bring about radical change in banking and world trade and give billions of people in emerging economies access to a modern, unified, digitised world economy. If it works—and it is still in the stars as to whether it will work—many things that are indispensable parts of our world today will soon seem as antiquated as Gutenberg's printing press."[196]

The same can be said for the much more extensive use of the blockchain technology behind it: they would make the intermediaries, authorities and all processing points superfluous in their respective fields of application. The result: enormous savings potential, because these institutions are basically not needed. Not only is the business model of banks thus threatened, but also that of expensive land registries with high court costs for the registration of a change of ownership in the land register or health insurance companies, which almost exclusively deal with

accounts. Blockchain "is an administrative machine, a technique that can make administrations leaner,"[197] says Voshmgir. But in most countries, it will still take a long time before this happens.

So cryptocurrencies are only the most popular and currently probably only relevant use case. However, blockchain can fundamentally change the management of all areas of life and politics, even outside of "money". In a portrait of the crypto-expert the business magazine *Bilanz* goes as far as to write: "What Shermin Voshmgir wants to see or at least can picture is companies without managers, countries without ministers. A state without authority?" The journal quotes her: "If social structures can be modelled as 'registers' and 'rules', they could also be represented as a blockchain and then the laws and incentives could be shaped in the code".[198] Voshmgir says of blockchain, it is "an operating system for a new way of organizing society. Perhaps we can solve many of the problems we have today."[199] This is exactly what we want, for example for e-government.

The philosophy and basis behind this is the decentralized network, whose members take over tasks and administer themselves, combined with an incentive, often a remuneration. Cryptocurrencies that manage without a central bank are the perfect symbol for this. In Voshmgir's eyes, for example, the political system has "a bad incentive system—none at all". Broken election promises serve as an example.[200] Despite the seemingly all-encompassing possibilities of use—above all administrative ones—she argues rather for the term "Crypto-Economics": it is "the coolest term ever. If we had called it crypto-governance, which also makes sense in connection with blockchain, not so many people would have listened to us. We are living in capitalism, after all."[201]

Blockchains have impressive properties:

- They have a decentralized organization—this makes them profoundly immune to manipulation and abuse of power.
- The data is unchangeable, the blocks are individually encrypted and there are multiple copies of all information—this is also an important protection against manipulation.
- The blocks are chained together, hence the name blockchain.
- All transactions are stored (which is why cryptocurrencies are not as suitable for illegal transactions as you might think).
- The rules are based on trust and transparency—even if everything is called "crypto" and partly cryptic.
- Transactions are very fast and efficient.
- The developers are independent.
- Anyone can participate.
- Smart contracts are possible—and thus a wealth of application areas that make business transactions faster and more efficient.

Why is a blockchain so secure against counterfeiting? Well, each participant has a copy of the blockchain in which all transactions are stored. Where there are amendments, they must be re-approved by the community. If one copy is manipulated, this would be noticeable when comparing it with the other copies. The rest of the network would not accept a falsified version; it would be worthless.

Incidentally, an often voiced prejudice about cryptocurrencies/blockchain is not true: people who do illegal business would

make a big mistake to do business with cryptocurrencies. This is because the transactions are explicitly transparent and comprehensible. Of course, the code must be decoded, but the relevant law enforcement authorities should be able to do so. The FBI and its colleagues can track the progress of payments—and that is the purpose and essence of blockchain and its security feature. There are little flags everywhere that show who paid what and when—with cash, for example, this is not the case, which is why the argument of money laundering is put forward there to argue in favour of abolishing it. It has long been possible to assign the IP address of a user to a bitcoin transaction and also to assign several accounts to one user.[202] Bitcoin experts Casey and Vigna write in their book: "Theoretically, any investigator with appropriate authority can force any organization providing a bitcoin wallet to reveal the identity of the owner. That's why some people think bitcoin is less a cover for criminals than an excellent police investigative tool."[203] "Follow the money" is a proven investigative tool that could paint a new, completely "holistic picture" of transactions and actors (which has significant relevance in terms of terror, corruption and so on) with blockchain.

The market turmoil, however, is great—and it is not only a drug dealer who would find this too thorny: the ten largest digital currencies—including Litecoin, XRP and Stellar—together have a market capitalisation of $176 billion (August 2018). Bitcoin holds the lion's share with $110 billion. At the end of 2017, the squad still had a total value of $450 billion. As a store of value—one of the functions of money, you will recall—cryptocurrencies are currently not yet suitable, even if the price may rise again.

The latter should not happen with the Venezuelan bolivar. And because Venezuela's currency has been the prime example

of hyperinflation for years—a staggering one million per cent this year—the dictatorship under President Nicolas Maduro is now also using crypto. In view of their massive economic and political problems, the idea sounds almost crazy. But at least the concept for the "petro" does not seem to be a quick fix, despite a number of strange points. Whether it will work or not is another story anyway. Moreover, Venezuela's new "real" currency, the sovereign bolivar, will be pegged to the petro, which has become the country's official unit of account. The petro, on the other hand, is backed by the country's oil reserves—but only on paper, and in "Venezuelan" as well—and was entered into the race by the government with a value of $60.

The fundamentally positive link to oil is tantamount to those proven principles of the past in which currencies were tied to gold or, in post-inflation Germany in 1923, the *Rentenmark* was tied to land. After all, Venezuela has the largest oil reserves in the world, even more than Saudi Arabia. But there is reason to doubt that this promise will be believed and kept at all. Finally, a substantial part of the oil has already been pledged to creditors, and production is at a standstill due to dilapidated facilities. Whatever the case may be, the number of petro coins issued or to be issued is not limited, while there may even have been enormous private placements in advance.[204] Rules for the socialist cryptocurrency also do not exist or have not been communicated. A devaluation—following the paper model—is thus well possible. In this respect, the petroleum is already at best a negative example, since the state probably does not even want to acquire the most important currency component "trust" in the first place. However, the currency immediately received some international recognition. The White House has issued an executive order that has included the petro in the US's long list of

sanctions against Venezuela. US citizens are therefore prohibited from acquiring this cryptocurrency.

How the petro may develop, that's in the stars. But the future of bitcoin is also uncertain. Despite its great merits, it is showing the typical characteristics of a pioneer, namely teething problems. The minus points clearly include power consumption. For a single transfer, around 450 kilowatt hours is required, more than a four-person household in Germany consumes on average per month.[205]

Even regardless of electrical requirements, many admonishers and critics are absolutely right. Unfortunately, there have been many cases of inconsistency, fraud and theft in the past. However, all this was not due to the functional mechanisms of cryptocurrencies and blockchains, but to criminal energy and a lack of security among service providers, who, for example, manage the wallets. The "wallets" contain the personal keys for bitcoin accounts. In addition, there are exchange and trading platforms as well as payment services. They have suffered so many mishaps that the reputation of cryptocurrencies has suffered greatly. In 2011, bitomat.pl, the second largest trading platform at the time, lost all of its customers' 17,000 bitcoins in a data breach (market value August 2018: €97 billion). In a series of thefts between February and July 2012, bitcoinica.com, the second largest bitcoin exchange at the time, also lost all of its 100,000 bitcoins with an incredible current market value of €570 billion. Other spectacular cases of similar magnitude and with comparable breakdowns and open barn gates for thieves were plentiful right at the beginning.

But even today there is no reliable and simple platform and no larger practical applications for cryptocurrencies in the real world. Nevertheless, cryptocurrencies/blockchain have the po-

tential to change our world, at least as much as the Internet has. With Blockchain, great digital control mechanisms can be established, which make processes in all economic and political areas obsolete. This principle will not only change services, but can also revolutionise the management of entire states with all its components, such as tax, social assistance, health care, permits, property, land registers and much more, which we will discuss in detail in the section after next.

We have mentioned several times in this book that blockchain/cryptocurrencies make intermediaries superfluous. This is however not entirely correct. After all, for all blockchains/cryptocurrencies, there are people working who create the currencies, examine transactions and validate smart contracts. All these people receive a fee for their efforts; after all, they have invested in equipment, electricity or time. In Ethereum, for example, the fee—the gas price—is calculated using a rather complicated system. If, for example, it is too low for the miners and other "volunteers", they can be delayed or even ignored, with the result that the intended process will take place much later or not at all. Ethereum gas and the like in other currencies is thus literally the substance that drives the system. And this raw material costs money, namely a corresponding unit of the cryptocurrency. In this respect, it can be said that even the supposedly autonomous crypto-world cannot do without real people and costs.

Despite all their pioneering work, cryptocurrencies are still in their infancy. If we use the Internet as a parable, we are in the early '90s and do not have a browser. The user experience is still bad for most applications. Added to this is the lack of regulation. The latter is a formidable barrier that has to be penetrated. Because of the lack of rules—which, on top of everything, someone has to enforce and sanction—we are currently experiencing Wild

West conditions. Many issuers of cryptocurrencies behave seriously, but by no means everyone—and the uninitiated have no information about where the good and the bad are to be found. So regulation is bitterly needed here to reliably establish blockchain and cryptocurrencies as an area of application. For their opponents, including parts of the fossilised financial establishment, are exploiting fraud and failures—and rightly so. This regulation can only take place internationally, as with a kind of UN, and in Europe by the EU. They are an essential prerequisite for success, otherwise there is no security for the users. Only in this way will it be acceptable.

This can only be initiated by the community, i.e. the developers and companies that are active in this field. The rules, laws and guidelines can be elaborated again splendidly by blockchain-internal coordination mechanisms, which are based on consensus. Self-regulation would be a start—and starting in the first place is the most important thing. Then, little by little, everything would be expanded, elaborated and perfected; it would be a living regulation following the Wiki principle. At the moment, however, nothing exists at all—and charlatans, fraudsters or modern feudalists who, for example, in an arbitrary manner only allow family & friends and coins they are well-disposed to on their cryptocurrency platforms, benefit from this, in what is often an unmitigated case of nepotism.

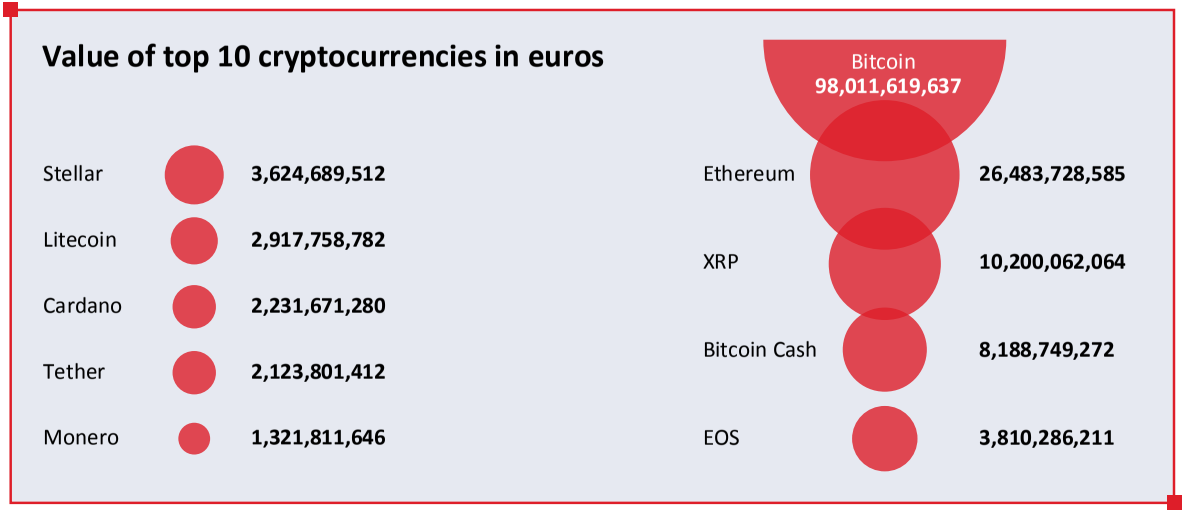
Of course, regulation is always a balancing act between too much and too little, but it is crucial to start with it in the first place. The main topics of regulation would be aimed at the issuers of cryptocurrencies, with regulations that we know from other financial products or IPOs: everything must be transparent, there must be regular and mandatory reports and audits. It must be clear to the buyers who is behind the cryptocurrencies. This

is not always the case, as one might think. Besides, something still needs to be defined—what are cryptocurrencies, actually? Are they currencies, as the name would suggest, or securities? There must be standards for these points that create clarity.

For currently, we have the blockchain market on one side, governments and banks on the other. It will be important to draw governments to the side of the blockchains, because a set of rules on this subject is only reliable if it is governmental; after all, breaches of the rules must be punished in case of doubt about the legal route. There needn't be a new surveillance authority to do this. Of course, officials who are familiar with the matter must be installed there. And the bottom line is that this set of rules needs restrictions and consequences, i.e. clear sanction mechanisms. Self-regulation with its own sanction mechanism would be a desirable alternative, "excommunication" from the community, for example, could be an effective tool here.

Tokens—cryptocurrencies of companies

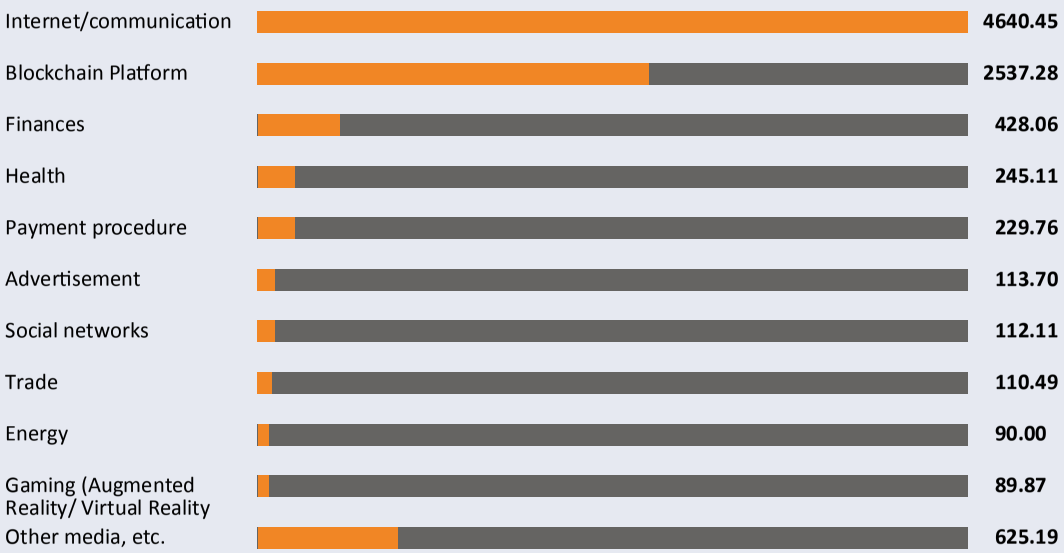
If a company—i.e. not a decentralized, public network—issues a cryptocurrency, it typically does so via an ICO, an "Initial Coin Offering". Here the currency is called the token, and through this token sale, the company's own cryptocurrency is sold to customers and other interested parties. It can then usually be traded and used as a network-internal allocation element. An ICO is among other things an instrument for raising capital and (still) benefits from lower regulatory hurdles. It is particularly attractive for young companies looking to finance projects. Our company NAGA also did the same with the NAGA COIN (NGC) and generated €42 million with 63,000 investors. In total there are 77 million units, 55 million of which are in circulation. This



Source: coinmarketcap.com

Cryptocurrency projects

Invested capital by industry in 2018 in millions of US dollars



Source: various sources (ICO Watch List), 2018

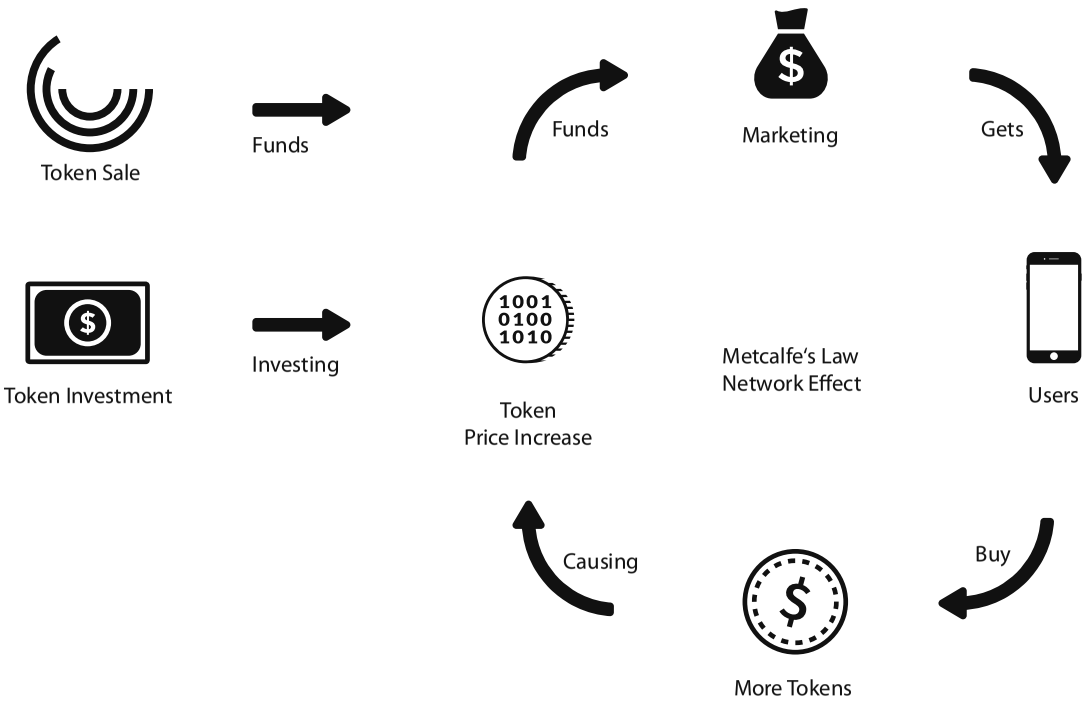
made NAGA the first company in the world to go public (Initial Public Offering/IPO) and stage an ICO within the first two years of its existence. In general, it is important—in contrast to the example of Venezuela—that there is full transparency, clear rules and clarity about the number of tokens issued. After all, this point is an important factor in determining value.

Technically, proprietary cryptocurrencies work on the same principle as their public/decentralized colleagues. However, in addition to the function of raising capital, they also have other specific characteristics. They can be used within the company and to pay for services and products. In this way they serve as the—often preferred or sole—payment method within the respective universe. It goes without saying that customers must receive added value that goes beyond mere payment. With our utility token, for example, we wanted to provide customers and token owners with a concrete benefit. You can draw tangible benefits from it, such as a bonus or fee savings. Our token is not first and foremost an investment, but is intended for settlement and monetary advantages—as the engine of our NAGA Universe.

Ideally, even the "Tokenised Flywheel System" is conceivable. Ideally, this theory looks like this: The number of tokens is limited, revenues from the token sale flow into the company. These are put into marketing on a large scale or even completely, and new products and services are launched. The improved offers attract more customers who also want to buy tokens. This increases the token price—which is good for the previous token owners. After all, because of the limited supply, their sale is the only way that interested parties can purchase the cryptocurrencies and enjoy the products and services.

The internationally active co-working provider rent24 also relies on its own token. In August 2018, it launched the PRY on

The Tokenized-flywheel-system



Source: Miko Matsumara

the market via ICO, initially with a price discount, as is usual, or in this case, with a bonus of 15 per cent of the coins. rent24 was targeting proceeds of $1.5 billion for this sale. Here, rent24 will be utilising the most important elements of cryptocurrencies in the future—their further function beyond payment processes, their use of the cooperation of others and the corresponding remuneration. The company not only presents itself as a modern service provider, but is also perfecting its central community idea: via the new platform, its members can get in touch with one another, advertise services, share knowledge and promote crowdfunding projects. The necessary interaction is enhanced by financial incentives. In addition, non-customers of rent24 can also buy tokens. In the future, all aspects of payment transactions within rent24 and all affiliated companies will be processed via cryptocurrency.

The service, user interface and user experience of such cryptocurrencies must be intuitive, easily accessible and comprehensible. Private providers must enjoy the trust of their customers or work it to get it, putting all their cards on the table. For example, we have relied on renowned partners, security and transparency towards token buyers. For the ICO, we formulated a whitepaper similar to a stock exchange prospectus, which we constantly updated—probably the most comprehensive of its kind at the time. In addition, we have sought advice from two luminaries of the blockchain world: Roger Ver of Bitcoincash and Miko Matsumura. In addition, we have set standards for customer support with a 24/7 live chat on TELEGRAM with generally more than 15,000 users in chat, and a hotline. We have therefore acted with maximum transparency and professionalism, because we knew and know that there are black sheep among the providers of cryptocurrencies.

Smart contracts

"The blockchain is essentially an alternative to certificates, state registers and public certifications. It is based on the idea that the truth and accuracy of its information is ensured by the multitude of public copies of itself within the online community," writes Nicolas Zimmer, CEO of the Technology Foundation Berlin, in his foreword to the publication *Blockchains, Smart Contracts and the Decentralized Web*—written by the aforementioned Shermin Voshmgir.[206] Whoever uses blockchains for important areas of life, quasi-official processes or even everyday matters, usually enters into contracts with them, in this case so-called smart contracts. They can be an important component of blockchains or result from their tamper-proof, airtight and verified functionality. They enable automatic contracts—without any human intervention and the aforementioned third parties and middlemen. This does not mean, however, that all participants become superfluous, but only those players who do not provide any added value. Contracts can also be monitored in real time. A smart contract is processed via blockchain under the condition that all parties have fulfilled the previously agreed conditions. A smart contract is "less a contract in the sense of civil law, but rather a piece of software that controls and/or documents a certain legally relevant activity or can even bring it about, provided that the given prerequisites are met,"[207] according to a legal assessment.

The use of smart contracts is particularly useful when the parties involved do not know each other and therefore no justified trust can exist between them, i.e. a "trustless" situation. "Smart contracts can fundamentally change industries that previously functioned as trusted authorities, archiving, verifying, authenti-

cating, licensing and making information available," says Voshmgir.[208] The blockchain is "particularly strong where existing structures cannot guarantee confidence in the accuracy of transactions and information," writes Nicolas Zimmer. Blockchain-based smart contracts are also particularly suitable where contracts are concluded quickly and without diversions. After all, many everyday actions, such as every purchase, taxi ride or visit to a doctor, are a kind of contract and/or a transaction. The underlying bureaucracy could be almost completely abolished by blockchain and smart contracts. Even dialling procedures would be—in any case from a purely technical point of view—a possible area of application.

Economic, administrative and political transactions of any kind could thus be carried out much more cheaply, faster and more securely than with previous central solutions. This is because the cost of centralized data storage is "that data backup, verification and certification of transactions are money and time consuming and are always a potential, central source of error, manipulation and censorship".[209] The US insurer AAIS therefore now wants to introduce a new insurance reporting tool with the help of IBM's blockchain platform. It is supposed to make reporting a great deal easier. Citing another example from the USA, marriages have already been sealed in this way.[210] For those who are now thinking, "How romantic!", here it only concerned the contract, and not the type of marriage or the attendant celebration. However, it is not known whether the marriage contract was concluded and certified by the community in this way—and whether it even had an effect.

One of the most important areas of application for blockchain and smart contracts could be all activities that are currently carried out by certification and registration bodies or notaries (pro-

vided they only certify something, i.e. do not write contracts). This is because a document once registered by the public blockchain is forgery-proof and eternally securitised. Of course, one needs an authorisation key to view it.

Above all, the state and its bureaucratic monster of authorities, offices, customs administrations, registration offices, local courts and tax offices could not only make its processes more efficient, but also save themselves daunting red tape and dust-covered archives. The possibilities with e-government are almost unlimited and theoretically cover everything we need authorities for, where we need to take a number, queue up, wait or beg for an appointment—from car registration to a certificate of good conduct, from the authentication of documents to the legally binding rejection of an inheritance, everything that the state has thought up in official procedures can be done. Long waiting periods or even the unavailability of the corresponding service due to sick or absent employees would now be a thing of the past. One could start with certification offices and registers—where standard procedures are usually involved and it is not a matter of decisions and deliberations. That is, where only a stamp, a signature or a tick is required. Disputed matters, such as the registration of an unusual first name, could then still be dealt with in the traditional manner. However, smart contracts for e-government are likely to be among the longest waits ahead of us—even though the savings potential here is enormous. The inertia of civil servants and the state, which is usually not too smart when it comes to matters relating to digitalisation, is likely to severely delay its introduction.

The currently greatest area of application—primarily fuelled by cryptocurrencies—is by a wide margin the financial sector, where payment transactions or transactions are the main focus.

The Santander Bank, for example, has calculated that it could save $20 billion by 2030 through blockchain technologies.[211] From the point of view of banks, blockchains/smart contracts represent a significant innovation: the highest risk banks face is borrower's default risk, i.e. if the counterparty, for example the borrower, defaults. This means above all the danger that the creditworthiness of a company, a state or any organization will deteriorate significantly, which is also expressed by a rating. This central risk—of course there are more—would be completely eliminated in a blockchain network, because the standing and above all the existence of the counterparty is ensured by means of smart contracts. We do not mean the default of the claim; this can still happen, for example, if a business idea does not work out or a company is over-indebted. This can also continue to happen, after all, blockchain does not undermine basic economic laws.

Also in taxation (a financial application), blockchain/smart contracts have what it takes to revolutionise accounting and tax payments. It would also make tax evasion more difficult. Especially in accounting, controlling and auditing, both internal and external, as applicable, we see a huge and presumably the next big field of application. Once again, it has to do with money and financial transactions, and this is already a highly standardised area, so that the rules and procedures can be relatively easily transferred to the new digital world. The blockchain automatically provides the necessary, unambiguous proofs and documents. Input errors and manipulations would also no longer be possible. In addition, the manual, individual invoice or tax audit by the responsible internal, external, commissioned, sworn and state persons would no longer be necessary. Smart contracts do this automatically, not just in random samples, but exhaustively.

In England, the top tax advisory firms sometimes demand more than £1,000 an hour for this. What a disgrace.

In general, sooner or later everything where brokers, intermediaries, brokers, settlement agents or intermediary platforms are needed can be put to the test—provided they do not offer any added value, but only give their formal approval. Let there be no misunderstanding: all of this is without a doubt still up in the air. And there will continue to be central authorities—but with a tendency towards their being fewer in number, and only if they bring additional benefits.

An opportunity for blockchain and cryptocurrencies also lies in the gaming industry, which we will describe in one of the next sections. The global gaming market has tremendous potential, and the trade with virtual goods, so-called in-game items, is growing steadily. However, the enormous market volume has also brought many fraudsters onto the scene, with the result that a similarly enormous black market without rules has established itself in the area of virtual goods. Blockchain offers the possibility to create a rule-based and safe environment for players and manufacturers. With NAGA VIRTUAL, we have developed the world's first legal and blockchain-based market for virtual goods.

It is crucial in all areas, including retail, that there is a critical mass of participants with compatible technology and software. This can only be achieved by standards and specifications and the obligation to use only the respective system. Here, for example, it is conceivable that a package will only open when it is paid for—whereby it is only paid for at the moment it is handed over, and not before. It is also possible that the smartphone contained therein can only be used once the payment has been confirmed. The same can happen with cars bought on credit. If an instalment is unpaid, the vehicle remains in the garage.

However, in order for smart contracts to work and function like traditional contracts in the foreseeable future, the legal issues must be clarified. Smart contracts are "not contracts of the classic kind in the form of texts that represent agreements in sections and paragraphs in such a way that they can be interpreted by people, namely the contracting parties, and in the event of a dispute by a court, but rather programmes that must be understood, controlled (i.e. examined for compliance with the conditions) and executed by machines," says Voshmgir.[212] Another obvious question is, which law should apply? After all, the devices and systems may not only be located in (the respective) foreign countries. Due to the decentralized structure of the participants in the network, they are also fully distributed and can no longer be assigned to any individual country. These legal points are also unresolved, just as there is still a need for action and research in many specialist areas, such as identity solutions and anonymity or IT security.[213]

Interim conclusion

Bitcoin and Ethereum can be compared to an icebreaker that clears the way and breaks up previously uncharted territory. The result was an enormous gold rush. Many have gone on a journey and promised their passengers paradise without ever having steered a ship. The $532 billion sunk by late summer 2018 are a consequence of this adventure. This has damaged trust—and a lack of trust is poison for any currency. Nevertheless, digital currencies are enjoying increasing popularity as a means of payment and investment, especially in Asia. We therefore do not hear alarm bells ringing. The introduction of paper money was also a laborious process and was viewed with scepticism.

We know how that story turned out. Another parallel is the historically large share price crash, even of today's top tech stocks: Amazon or Cisco had declines of 99 per cent and 86 per cent respectively in the early 2000s from their previous respective all-time highs. Anyone who believed afterwards that it was over and done with these values, or even the entire industry, was obviously wrong.

In this hysteria, however, many people forget that cryptocurrencies have only experienced this great increase in value in recent years. And we have described the prospects in detail as one of the cornerstones of our future.

2019 will be important for cryptocurrencies. We expect to see significant consolidation in the near future: numerous cryptocurrencies will disappear from the picture; only the good and profitable ones will prevail in the long run. But even if many disappear, the total market volume will rise again, and the market will stabilise—also because cryptocurrencies are becoming more and more mainstream. The best example is Goldman Sachs, which recently entered the bitcoin trading business.

Even more valuable, however, is blockchain technology, which enables automated smart contracts and also provides the non-manipulable proof of ownership of anything whatsoever, be it land or money.

Financial inclusion: All financial applications under one roof

Even if it sounds paradoxical, in this section we will bring two opposing things together: On the one hand, we are convinced that the fragmentation of the financial applications of recent

years should be reversed—in other words, a certain centralization must be achieved, which is above all in the interest of the customer. At the same time, we advocate decentralized networks. But these are two very different animals, which is to say, levels.

The technology behind blockchains is decentralized, and that is most expedient, as we have discussed. This is the only way to ensure that processes and protocols are tamper-proof and that nobody can censor or falsify them. This would require 50.1 per cent of community power—theoretically conceivable, but practically impossible. On the other hand, we can see how the market developments of the past decades have led to a strong fragmentation of financial applications. The increasing variety of providers, apps, implementations or means of payment could further fuel this fraying. But how sensible is it to manage a wide range of payment options, wallets, share deposits, bank accounts, financial investments, construction loans and insurance accounts with various service providers and financial institutions? Added to this is the rapidly growing market for virtual goods, which we will address in a moment. Therefore it is important and above all feasible—despite our paradigm of important decentralization in technology/blockchain—to group together under one roof, securely, simply and without banks and other intermediaries, all that pertains to monetary matters: private investment, cryptocurrencies, virtual goods and everything else.

The solution is *Financial Inclusion*, which has several core elements:

- a **currency** that works across many asset classes, components and continents, keeping everything together and running smoothly

- cross-asset **trading and exchange platforms**
- and a centralized and intuitive **interface** that connects everything.

Modern technology and blockchain make this all-embracing networking possible in the first place. On the other hand, it produces the savings and efficiency effects in processes and handling that are revolutionising the financial market. The winners here will presumably be the providers of the platforms mentioned at the beginning of the book—and no longer those who offer financial services and financial products. Christian Sewing, the new Head of Deutsche Bank, has also recognised this, saying in January 2018: "If digital transformation turns an economy of producers into an economy of platforms, then the entire economic life will change.... In view of the market power of the platforms, it is clear that in many cases it is no longer the manufacturers of a product who have the say, but the dealers. (...) We must become the leading platform."[214] In keeping with his role, he sees himself as a future key player. But as we have described above, this position will be difficult to reach. For it is precisely this networking, the development of platforms and the organization of this bundling that FinTechs can do much better—and with great added value, because otherwise they would be solely middlemen who would once again be obsolete for the foreseeable future. The scientist Geoffrey G. Parker also sees the enormous importance of the so-called two-sided markets: "Banks (...) will soon feel the pressure. (...) So far, they have been able to avoid disruption through platforms, mainly due to strong regulation and a comparatively conservative and risk-averse customer base."[215]

The role models for these effects are other industries that have successfully shown the way: Airbnb does not have any beds

or private apartments of its own and in 2017 made a turnover of around $3 billion by simply arranging accommodation. Amazon, although also showing a strong presence with its own offers, products and services, had a turnover of nearly $32 billion with items from other sellers. The business magazine *brandeins* states: "Whether Apple's App Store, YouTube or Facebook's advertising space: almost all the major IT success stories of the recent past are platforms, often referred to as aggregators or bilateral markets."[216]

The dramatic advantage of platforms lies in their scaling. The additional costs for each additional user are negligible. So, the more users these giants have, the lower the cost per person will be. In addition, all this has self-reinforcing effects. The more users there are, the more stream in. This principle is much greater for social networks, since it is important that one's friends are members on one and the same platform. This situation is negligible for online shops. However, this does not apply to providers and partners who use Amazon & Co. on the sales page. They are dependent on participating there where most buyers are. And the more companies do this, the more attractive and cost-effective the portal becomes, which attracts more clients. There won't necessarily be a winner-takes-it-all case here, as with Facebook, for example, which has nothing on par with it outside its corporate group to fear. Nevertheless, it amounts at least to strong oligopolies. This platform economy is thus developing exponentially.

If such platforms are an important pillar of the global economy, it seems that this business model will make American and, to a certain extent, Chinese ones successful. For example, the *Institut der deutschen Wirtschaft* (IW, "German Economic Institute") has examined 110 digital platforms whose market value is

$1 billion or more and which are not listed on the stock exchange, including Airbnb and Uber. Its finding: it is not the USA with its globally successful platforms—which are admittedly world market leaders listed on the stock exchange—that dominates the ranking, but China, with 48 per cent of all such companies. The only reason they are not known in the West is because they are either largely active in China and Asia or not market-listed. The USA is only second among the 110 largest companies, with 29 per cent. Europe is lost. Only five per cent of the most promising platforms are at home here.[217] "The poor availability of venture capital in Europe is one explanation for this result. This can restrict the establishment and growth of platforms in Europe," writes the IW.[218] Other reasons are the relatively small European submarkets—at least compared with the USA and China—which also require a certain amount of additional administrative effort.

From our point of view, the time is ripe to lead such a strategy to success for the financial sector as well. In contrast to the other parts of this book, we would like to report a little more on this topic using the example of our own company, NAGA; namely, how we implement this centralization concept there, how we have virtually dedicated ourselves to it. Because at this point we are concerned with nothing more than the goal of an overarching financial and global linkage; of financial inclusion—and indeed of financial products, financial services, apps and implementations. In addition, our products include all major (digital) asset classes: traditional financial markets, cryptocurrencies and virtual goods.

Added to this are previously neglected customer groups worth billions, which should be integrated into the financial market but have so far been excluded. The fragmentation of asset classes, currencies, trading platforms and products will thus come to

an end. At NAGA, we are organizing financial inclusion with our products, services and apps as follows:

- One of our most important applications is the social trading network **NAGA TRADER** (formerly SwipeStox), an app that combines social media with trading on the stock exchange. Members can follow other members there, copy their business and financial decisions—and attract followers themselves and interact with them. If followers are won around, the customer receives a bonus. This service is fuelled by extensive discussion and information possibilities. In addition, on NAGA TRADER you can trade in traditional financial markets, cryptocurrencies and virtual goods (e.g. from games). In practice, an AK-47 from Counter-Strike can thus be deposited as a security for the purchase of Apple shares.
- The **NAGA WALLET** consolidates all services and products. In it, the virtual goods and currencies are stored and transferred, and additionally, transactions settled.
- On the EU-licensed and regulated financial services provider **NAGA MARKETS**, one can trade several hundred financial products, crypto-assets and virtual goods.
- Our cryptocurrency **NAGA COIN** is the blockchain-based driver of this financial inclusion. It is based on Ethereum and is the hinge and unit of account between all our elements:
- Examples of goals of this inclusion:
  - A World of Warcraft gamer from Indonesia can use their in-game weapon as a deposit/security to buy Apple shares or obtain a recognised online degree in finance.

    - Holders of Apple shares can charge their NAGA CARD and purchase a car.
- **NAGA VIRTUAL** is an international and, above all, cross-provider trading platform for virtual goods, such as treasures and values from computer games. We launched it at the end of 2017 together with the first customer, the Japanese games provider Asobimo, then still under the name SWITEX.

Our ecosystem is constantly growing, and it is important to us that users are able to manage all their financial needs from a single source. Our platform is a solution. Of course, there are other similar possibilities. What does this mean for banking and finance? The market for virtual goods will explode as a result of the new drivers and forces—if such a transparent platform for global exchange that links everything together is created. New financial products, services and applications will provide a complete global financial network: the entire portfolio, all cryptos and ICOs, all transactions and financial actions and the wallet organized in one app. We regard this fundamental inclusion at all levels—where even successful FinTech are only active in parallel—as the democratisation of the financial system. Because it means participation for all.

With our financial products and services, we want to drastically simplify access to all facets of the financial world. At the same time, we would like to help people, especially in Africa, to see a perspective in their home country again. In our opinion, both have a lot to do with each other. Because, as described, the traditional financial world with its structures, actors and methods in no way serves the needs of today's customers. This is true in the Western world, the home of high finance, but especially in poor-

er countries. For Westerners, it is a nuisance and expensive, but for Africans, for example, it has fundamental consequences: many of them are completely excluded from the financial system. They cannot save money, transfer it easily, make provisions or buy insurance products. They simply do not have access to an account—and, as we mentioned, this affects 1.7 billion people worldwide. But those who cannot participate in such basic things are more likely to consider leaving their homeland. Such new, above all more efficient and easily accessible services could help to prevent this, even if there are of course many other causes for flight in Africa, for example, overpopulation, corruption and complete indifference of the ruling elites to the fate of their peoples. But here again, blockchain technology could provide significant redress when it comes to "corruption".

Let's stick with Africa for a moment: a high proportion of the population there is young, and most of them have a mobile phone: in terms of total population, two thirds. And from now on, this mobile phone is the account, the money card and the transfer slip. With the help of digitalisation, we are dramatically facilitating access to financial products, because none of the established financial players continues to be necessary for processing—and therefore no longer has to be paid for. In this way, the entire cost structure is improved, more people can gain access—and with the financial processes they can finally participate in economic activities. We see this as a major possible contribution to economic growth and thus to jobs that are created at home. For us, it is nothing less than a democratisation of the financial system.

Another important issue there, as in other poorer countries, is sending money home to support relatives. Most service providers accept this, as explained, but charge hefty fees for it.

NAGA products and our cooperation with MyBuckets, for example, which has a strong presence on the African continent, are also helping here. This allows customers to send money at a fraction of the previous fees. In this way, the recipient achieves almost the full transfer sum, which in turn additionally supports the local economic cycle.

The average level of education in Africa is not particularly high. Our apps and products are therefore very easy to grasp and understand, and they work intuitively. And of course the young target group in Africa has grown up with social media just as much as elsewhere—if anything, to an even greater extent. So they are familiar with the functional principles and can therefore immediately find their way into our products—which are basically simple in design.

However, the poorly developed infrastructure in Africa is still a major obstacle. Indeed, this is precisely one reason why so many people, especially rural dwellers, have up until now been excluded from financial services. The roads leading to the provincial capital, for example, where the bank is located, are often arduous. The mobile network, however, and only this is relevant for us, is relatively strong. Unlike the other poor infrastructure, it is almost exclusively privately organized and covers large parts of African countries. This problem has therefore been solved from our point of view, especially since most Africans are very mobile phone-savvy, have long been accustomed to payment methods via smartphones and mobile phone companies are among the most important economic factors and innovators there. However, there is still one major drawback: the high mobile phone tariffs. They are not only higher than ours in relative terms, but also in absolute terms. Flat rates there are virtually unknown. Almost everyone uses prepaid cards that are used up

faster than one would like, and the tariffs are not always transparent. This has to change before there can be a real digital breakthrough.

Social trading

Isn't it quite antiquated how large parts of the investment market still function today? Depending on their function, consultants, analysts, rating agencies and financial journalists examine the market and recommend financial products. If the suggestions and information appeal to the investor, he or she buys the fund or the share from a bank or financial intermediary. Generation Y and Z would say, "That's pretty '80s." And it is also enormously fragmented.

This is because "social trading" has existed since the middle of the 2000s decade at the latest and is currently developing with great dynamism into an alternative to the old-school approach. Social trading links the achievements of interactive Web 2.0 with direct stock exchange trading. Investors can exchange information and follow others as they do with well-known social media. However, this is not about holiday photos or comments on private preferences, but about copying their investments, investment decisions and strategies. Everything that a model trader trades and owns there is public. A follower can choose to go piggyback. In the process, a trader trades for others. In contrast with financial intermediaries and bank advisors, this is a completely new transparency. This is because the huge advantage of social trading is the possibility to react in real time to the actions of the trader and to benefit from their experiences.

With the relevant apps, members can follow other members and directly take over the selection of their financial products.

Everyone can generate followers themselves through their figures and investment decisions. In addition, customers often receive further information: news, discussions or even a TV offering.

Social trading FinTechs usually only offer exchange-traded or regulated products. Of course, the form of investment counselling itself and the interactive generation of information and opinions are unregulated. So the big question is, can I trust who I'm following? We advocate "conscious and responsible trading": "copying" should never mean "blind copying without thinking". Just as there is the responsible citizen, we advise everyone not to lose sight of the basic rules when buying shares or derivatives: i.e. above all, to assess the risk and weigh up the (supposed) profits against it, and that previous profits of the "role model trader" are no guarantee for one's own revenues.

But traditional intermediaries and consultants do not have this guarantee either. Therefore, we consider social trading to be very suitable for the phases of brainstorming and selection of products. The investment decision, however, should not be made too easily. This is true because total losses are of course also possible. After all, nobody knows today what will happen to a stock or currency the day after tomorrow; even the cracks cannot look into the future. Strategies and ideas can be copied, but not the exchange table of the past.

It is therefore important to install guardrails: With our NAGA TRADER, *for* example, self-learning algorithms index the activity of the users, their actual performance—and calculate the risk level of the trader, which is displayed as a core element. In this way, everyone can see what risk they are taking according to their own self-assessment. Such precautions ensure that traders are real and not trading with automated systems—especially

since the community with its swarm intelligence can examine any "role model" in real time.

All this is no guarantee for profits, but the alternative hitherto available has great disadvantages in our eyes: most financial advisors pursue their own interests—not those of investors. And they have to do so, because they usually stand for a bank with its own products or products distributed by it, or for a financial distributor. We as operators of social trading also have to earn money, but our fees are drastically lower. In addition, we do not make any recommendations, as the members do this among themselves. This ensures the highest possible degree of independence and enormous transparency.

Pure sales consultants at banks and financial intermediaries will, in our opinion, become virtually extinct. It sounds dramatic, but we don't think it's presumptuous: it is nothing other than the democratisation of investment recommendations. Here, too, the potential is enormous: The aforementioned Dorfleitner FinTech study for the Federal Ministry of Finance already assumed a market volume of around €1.3 trillion in 2016.

Virtual goods

The market for computer games is staggering. It has long been an industry like any other, such as automotive engineering, and an enormous economic factor. Anyone who plays with mobile apps spends an average of $86.50 a year on in-app purchases of virtual goods. Depending on the game, however, gamers are even more willing to spend money, with just under $550 per user on *Game of War Fire Age* and income of $2 million for the publisher on peak days.[219] And even if they are only *Thunder*, *Colour Bomb*, *Stripes*, *Extra Time* or *Extra Move Chess*—in 2017

48 per cent of game manufacturers' revenues came from in-app purchases, only 38 per cent from the purchase price and 14 per cent from advertising. Gamers are now sitting on a big chunk of change. They have items worth billions that make up a game: energy, weapons, power, time, food, money or multiple lives. But the manner in which cars can be traded on an established and transparent used car market—without which the primary market would not function at all—has only recently become a reality for games. The treasures that hundreds of millions of players hoard from tens of thousands of players are enormous. Some want to sell swords because they are switching to another game, others lack a magic potion. But until recently, reliable trading was not possible in a serious, professional and, above all, cross-supplier manner. Hard-won gold talers, powerups or special abilities often lay useless in a game account; only without the possibility of gathering dust.

The only way so far has been via the black market. It can function in pure terms of trade, but there is a lack of legal certainty, a concrete reference such as a fixed physical location and, above all, the direct exchange of money for goods, as we know it from post-war films. This negative side has led to losses for game manufacturers, for example because users were frustrated and drifted away from the game.

We have changed this with our platform NAGA VIRTUAL. While we don't want to deal with our company so much in this book, some of our products, insights, and ideas simply best illustrate how certain aspects of the financial revolution and financial inclusion work—and the virtual goods market is an integral part of it. Items from computer games are only one area of application, even if they are the most popular. Like cryptocurrencies in relation to blockchain, they can pave the way to a com-

pletely new industry—whereby the market has long been there. Virtual goods account for an annual volume of $50 billion, with a growth rate of ten per cent.

The problem: players can usually only trade their valuables via the game provider or on obscure, unregulated platforms. They often cheat and steal. What is missing, then, is that which is the thread of this book: trust. In this way, however, all market participants, above all the game manufacturers, are hesitant to really get involved—which is slowing down the industry's development. Just as buying a new car usually only works because the old one is traded in as part of the payment, the gaming market could gather even more steam if one could rid oneself of its goods again. Conversely, the great demand for "used items", possibly even rare pieces, can advance the game's development, boost game sales and open up new target groups, from which publishers or even console manufacturers can benefit. But one can also simply use the trade with game items to cash in or speculate. So, for example, buying *Counter-Strike* weapons cheaply and selling them later at higher prices. For manufacturers, a modern platform now means, on the other hand, tapping new sources of income—especially since they receive a share of the commission—and binding gamers more strongly to the game.

All these mechanisms have so far either not taken place or have taken place only to a limited extent, which has now been changed, mainly by NAGA VIRTUAL. The gaming community and industry have long waited to operate in a fair, secure and legal environment. Our new marketplace offers this, and it works as easily as eBay, with a fixed price—which of course has to be market-oriented. And this can indeed run into several tens of thousands of euros for rare pieces. So the items are real assets and can be bought without the game. Players trade with one

another or buy directly from the publishers, who now finally benefit from primary and secondary markets. Because they, together with the developers, want to avoid frustration and dissatisfaction of their customers and instead promote participation in the safe trade with virtual goods within their games. A specialised and trustworthy platform ensures that gamers no longer have to worry about paying a few hundred euros—without actually receiving the laser sword.

Just what kind of market are we talking about anyway?

- 78 per cent of App Store and Play Store revenues were generated by games (1st half 2018).
- Expenditure rose by a good 19 per cent to $26.6 billion in both stores.
- Strike by Mixi and Fate/Grand Order by Sony Aniplex were the top-selling games in both stores.
- "Entropia Universe" was the most expensive sale of a virtual object in the Guinness Book of Records in 2004 and 2008. In 2009, a virtual space station, a coveted destination, was sold for $330,000. This was surpassed a year later, with the sale of "Club Neverdie" for $635,000, which was then split and sold in parts, the largest of which sold for $335,000.
- In 2009, it was estimated that the "Gold Farming Market" within so-called MMORPG games (massively multiplayer online role-playing games) was worth $2 billion worldwide.
- Only a few days after the launch of Pokemon Go, dozens of websites had "levelled-up accounts" for sale.
- In 2009, the value within the game Second Life, launched in 2003, was worth the equivalent of $567 mil-

> lion. For the 10th anniversary, the production company "Linden Labs" estimated that transactions worth about $3.2 billion have taken place. Some top players earned more than $1 million a year in revenue from real estate, fashion or event management trading.

So, overall, and in individual cases, large sums are at stake. For this reason, legal certainty is also important. It is therefore essential to involve regulatory authorities and gaming associations. In addition, all items in NAGA VIRTUAL, for example, are secured in a shared ecosystem with the publisher. This means that they cannot be reproduced, stolen or manipulated. In our case, it is an open platform, developed by players for players. Incidentally, not all items are suitable for trading. That is why our publishers decide which items users can buy and trade. This prevents fears of inflation or deflation—factors that we know from the "proper world of finance". Here, too, the decisive factor is networking, i.e. cross-vendor and cross-device access (PC, console or mobile app) and finally linking with other financial applications, all under one roof.

Virtual goods are more than game items. Holdings from games, however, represent enormous values and can in this way promote the acceptance of such worldwide trading platforms and help them to break through—which in turn can be extended to other elements. Thus, the time and money invested have not only created experiences, but are now even paying off.

So a revolution is quietly taking place. What has it been like so far? The tax expert Dr. Hans Müller[220] sits in Frankfurt, Germany seven days and nights at a—actually completely virtual—tax assessment on a virtual tax avoidance in a rare situation and receives €5,000 for his efforts. He bills his client, who pays; the money ends up in his account, and he buys his groceries by

credit card on Saturday at a supermarket. Jong Kim in Korea and Felix Mustermann in Vienna are gamers. One plays *World of Warcraft* and the other *Counter-Strike* at the highest level, both having invested a great deal of time in game progress and receive a number of virtual goods—an AK-47, a BMW M5, a gun, a figure that rises from the dead and an animal.

In the future, on the other hand, he will use this highly specialised knowledge and sell these virtual items on the regulated NAGA Virtual Platform—an exchange for virtual game items—either against US dollars, euros, yen or against cryptocurrency. These proceeds are credited to his NAGA Trading (IBAN) account, and with his NAGA CARD, he can buy Mountain Dew or organic vegetables at the weekend, depending on his taste.

Such technology gives gamers the same technological and economic infrastructure for trading virtual goods as the ladies and gentlemen in suits who trade virtual financial products on derivatives exchanges. In our opinion, it is "The Next Big Thing"—and this is disruptive. The NAGA GROUP AG has already constructed most of it, and it is already live in some cases.

Utopicash

For years, we have been working on a concept that brings together and practically solves many of the aspects addressed in this book. It is a kind of summary of the previous content and also a vision, but hopefully soon, a feasible one. We have designed it to be very practical, and the purely technical prerequisites for rolling them out are by and large there.

Utopicash is our dream of a perfect blockchain world in which all social and economic processes are controlled. This model

can be organized decentrally, so that nobody has their thumb on it (not even us). In this place, such a system can and should be created and developed by the community. Besides, and perhaps first of all, the state can make use of such a principle. Such a cockpit in the government quarter is of course not decentralized. But those elements can be inserted that legitimise the state with its people's representatives, namely voting processes by connected citizens. For the first time, we are explaining our concept to a broader public by explaining the basic guidelines and functional principles.

What is Utopicash supposed to achieve? Our goals are ambitious:

- Utopicash can facilitate each and any administration and control of social, financial and economic processes—and thus also permanent control (democratically legitimised, for example by users) in real time.
- Utopicash can organize the distribution of funds in the social sector—in a much more targeted and efficient way.
- Utopicash can automatically collect taxes and thus control incentives.
- Utopicash can automatically initiate tax deductions and thus also precisely organize their distribution.
- Whether subsidies or inflation—all economic parameters up to voting rights, which might be bought if necessary, can be managed. This is organized by means of smart contracts.
- Thus Utopicash can create mechanisms to specifically serve remittees of any kind. Social assistance recipients, for example, only receive money through this system and can only spend said money on it—and thus not on

cigarettes and alcohol, for example, or whatever the community decides.
- The idea of an unconditional basic income—which we both find great—is also possible through this creation.
- Utopicash is the blueprint for a decentralized steering mechanism and individual control. A kind of e-democracy, with the possibility of live intervention.

Why do we need Utopicash? What constitutes the target group?

One reason for this is the possible drastic consequences on the labour market due to automation, which, however, cannot be clearly assessed and, of course, not predicted. Nevertheless, some things can be said or discussed: Many jobs are pseudo-jobs—in today's world already. And further jobs will be eliminated by digitalisation and blockchain processes. Finally, many activities stand for the aforementioned "mediation or confirmation work". The American professor David Graeber has also come to similar conclusions in his current book *Bullshit Jobs: A Theory*. He says that more and more people are performing activities "that are unproductive and therefore actually superfluous—as real estate agents, investment bankers or management consultants. They are jobs that make no meaningful contribution to society. They're bullshit jobs."[221] He estimates that at least a third of all employees have such useless work.[222] In addition, in spite of the oft-cited shortage of skilled workers, some highly qualified graduates already have problems finding suitable jobs today. One of the reasons is that they are not adequately capable and trained. One may be top-notch, but not suitably top-notch. In addition to automation, heavy work and routine work will disappear, for example in automotive engineering and fast food restaurants. Everywhere.

But what do we do with these people? They still need money—and at least the Western and Northern European countries represent welfare states that do not allow anyone to fall through the cracks. There may well be highly developed social systems there, but they are inefficiently organized. Utopicash can do this better—and will presumably have much more demand and "clientele", especially as a result of digitalisation, with basic income by definition being something all citizens would be entitled to anyway. Blockchain technologies are one reason why many jobs will be lost—but at the same time they are also solutions for providing for members of society, for example through Utopicash.

Utopicash is of course a fantasy, but a highly feasible and above all necessary one. Because technological progress presents us with enormous societal challenges—which are looking for solutions. Blockchain technology is being refined every day. In practical terms, such a system could soon take off. The big questions and hurdles are therefore other questions:

- Is our society ready?
- How do we organize the system so that it does not create false incentives and invite abuse? By this, we don't mean the technical side, but the danger that people will lie down in the proverbial social hammock and no longer do anything for society. All this could be addressed by a self-learning and constantly changing system. Because it is never full and complete anyway. (We have already explained in detail that the current financial systems are essentially "trial and error experiments" with a moderate record up to now.)
- How do we start? It is the crux of such a principle that it creates incentives that have consequences and change

behaviour. If this only affects a small group within society, it is anything but democratic. On the other hand, you can't start with a whole country at once, at least not with a big one.

- So who is included here, anyway? Ideally, we want to involve all people. This is however not possible, especially in the starting phase. In this respect, a social system à la Utopicash—especially if it includes something like the unconditional basic income—would provide further massive incentives for a move into social systems. It is therefore realistic to start with Utopicash in small groups within contiguous areas, for example in the Baltic States, which on the one hand come close to a welfare state of Western character and are on the other hand pioneers in digitalisation, especially Estonia.
- Who should pay for all this? Of course, it is not a financial perpetual motion machine, and we are not throwing economic fundamentals out of kilter. But there is a massive social redistribution in the Western states anyway. In Germany, for example, there are so many payments through the state that probably nobody has a complete overview: unemployment benefit (two levels), child benefit, basic security, tax refunds, pension, widow's pension, orphan's pension, disability pension, compensation, federal education support, housing benefit, parental benefit, temporary scrapping premiums for cars. All these payments already exist, but they are calculated, managed and distributed in a costly and complicated manner—with high processing costs for civil servants and authorities. The high administrative costs as a rule account for only about one per cent of total revenues, and let us not

> forget how much money transfer services charge for their work. In contrast, the state appears to be an inexpensive administrator. But even this one per cent would not only become drastically more efficient through blockchain; an unconditional basic income—which is paid out as a lump sum, with no benefits beyond that—would make all these individual transfer payments superfluous. The inefficient and expensive redistribution industry, which in total takes a big slice of the pie, certainly doesn't need any more. Its share of the costs would be released.

And now, let us be specific: the springboard for Utopicash is the fact that we have been using money in some way for 10,000 years. More or less beneficial and useful as a medium, we have described its useful functions above. However, all this had/has its price, namely massive problems that are still threading through monetary history until the present day:

- Stagnating economic growth
- Unequal distribution of wealth
- Money laundering and corruption
- Terrorism and war
- Intellectual and innovative potential wasted or invested in areas that do not benefit humanity
- Poverty

So something has to change in our monetary system!

Utopicash is our solution. And it has four core elements:

1. Unconditional basic income
2. Real-time self-depreciation of the currency
3. Real-time control of wealth distribution, the economy and taxation
4. Tax deduction in real time

With Utopicash, the asset/property is completely based on a blockchain, i.e. digitally with a transparent, traceable cryptocurrency that devalues itself. But why do we incorporate inflation?

The basis of all this is the unconditional basic income. There are many ideas for this, among others from economists and Nobel Prize winners. However, they all contain a comprehensible deficit that is for this reason often rightly invoked: states would have to increase taxes in order for all this to work. With Utopicash, this is not necessary. Automatic devaluation encourages people to spend their money, i.e. to consume or invest. Of course, they can keep it and "save" it, but it loses value, except for certain purposes. This expenditure immediately generates taxes (income tax and/or value-added tax [VAT], depending on the system)—and the system actually collects them immediately from the recipients and makes them available in no time at all. Through this immediate taxation and simultaneous depreciation of money, the system finances itself, above all, without tax increase. Even better, we are in favour of a radical simplification of taxes and ideally advocate only excise duty/VAT and, where appropriate, a transaction tax. Nowhere should there be tax increases—but rather simplification. States tend to continue to tighten their screws or to retain taxes once they have been introduced, even after the respective occasions have ceased to apply, such as the bizarre history of the sparkling wine tax. It was introduced in 1902 to finance the Imperial Navy, reduced to zero

in 1933 but not abolished, and finally reactivated in 1939 to finance submarines. And so it continues to exist until today....

Our ideas of Utopicash do not stipulate any price control. We continue to rely on the market-based pricing mechanism. The e-wallets will have different "compartments".

- One of these will be reserved for the unconditional basic income. Smart contracts will determine the output of Utopicash there. For this purpose, a lower depreciation of money will be set, especially for existential expenditures of services of general interest, i.e. water, energy, education, health, food and Internet.
- Utopicash Coins will also be available in retirement/pension compartments, for investments and the purchase of real estate. A lower loss in value is also planned for these later or larger expenditures—which also necessarily include a savings component. And those who subscribe to their own country's government bonds, for example, can also be rewarded by the government with lower deductions.
- The transfer of Utopicash between the individual compartments is permitted within certain limits and directions.

There will always be attempts to escape—i.e. to transfer the money elsewhere or to spend it for other purposes. But these are then deliberate or impossible. Both sides benefit from Utopicash: the state and its citizens. The state is only the service provider anyway—but it must still be able to function.

From the citizens' point of view:

- Property/assets are distributed fairly. Anyone can live in dignity and/or become rich.
- The money supply is stable.
- They receive sufficient quantity of money on the basis of the unconditional basic income.
- The will of the community/people is translated into concrete actions and an immediate introduction of new parameters/rules—and everyone can follow this on their monitor/display in real time.

But the country also benefits from Utopicash—and this is not some distant authority or abstract entity, but the service provider for the citizens:

- Poverty is abolished.
- The economy prospers.
- Utopicash supports the desired ideas for justice, wealth, growth, innovation, tax, income and health care.

But Utopicash achieves even more. The system performs a number of other important functions for citizens:

- Participation in the democratic process of decision-making, at different levels: country, region or city is facilitated.
- There is absolute transparency, usability and evaluation possibilities of all available and collected data, and indeed for one and all. This equalises the enormous knowledge advantage that corporations or hedge funds can use for their profits. All persons now have equal access to the aggregated findings of the database (full data ware-

house transparency, our working title). In addition to comprehensive statistics, all payment flows are recorded simultaneously, with the possibility of tracing individual, private payments being ruled out. All this has to be defined for each system, we only want to present the possibilities here, especially those to end the information asymmetry.
- The parameters are based on respective personal interests.
- Selected areas of use are preferred/subsidised.
- Additionally, a kind of family cash can be furnished with a preferred wallet compartment.

Utopicash also supports important goals of the country:

- It precisely controls the collection of VAT and self-depreciation—and the re-distribution of up to 100 per cent in the form of an unconditional basic income.
- It can fully replace income tax with VAT (if so desired).
- The infamous Tobin Tax (see below) could be introduced and "tried out". Basically, in such a system, it is much easier to mould, test and try out—with direct data as results (as opposed to a system currently driven primarily by [individual] interests and opinions).
- Merchants can obtain an extra interface for their purposes.
- Targeted support/subsidisation of individual industries in real time are facilitated.
- A certain amount of Utopicash coins/units is reserved for education, health, culture or the like. This money is devalued more slowly or not at all (but cannot be transferred).

All processes that the system is to perform can now be displayed and controlled live—transparent and comprehensible to everyone. Sitting at the lever is the equivalent of a national bank, democratically legitimised by the decentralized community:

- It determines the amount of VAT (fluctuating within a possible corridor).
- It determines the loan amount for each citizen.
- It determines the quota and the period for self-depreciation or its targeted use for selected purposes via smart contracts.
- An API interface interacts and exchanges information with other cryptocurrencies.

This is in general terms, enriched with some details, our concept concerning Utopicash. Now, understandably, the question arises as to how it can be implemented in practice? For Utopicash is not a fixed idea. Behind this are many years of work and a visionary group of renowned entrepreneurs and scientists.

There could be two types of Utopicash: when the currency leaves the country, devaluation is stopped, and resumed when it is re-imported. In this way, international trade relations (import/export) can be paid for. This gives one and the same currency different characteristics, which is particularly important for cross-border exchange. In the very, very distant future, we can also imagine that the Utopicash system could be established without the involvement of governments.

As already mentioned at the beginning of this chapter, the delicate starting phase is of particular importance. On the one hand, because it should function naturally; on the other hand, because the system only works within a closed group and can in

turn prove its mass suitability there. So one has to start small, roll it out quickly and then refine it on several levels:

- Thematically, for example with the social system
- Geographically, for example with small islands or small countries, such as the Baltic States
- By target group, i.e. a selected group of people.

We are assuming an experimental phase of at least four years, during which the concept can be tested and continuously further developed. It is also, for all its own scepticism, a system that, for the first time, does not try to solve problems with the means and ways of thinking that it gave rise to. There is nothing that says things will get better if things change; however, things need to change to have the chance to get better at all.

3. CONCLUSION

Blockchain and high tech— What does this mean for the society of the future?

Whether with Utopicash, a solution of other providers or something wholly and completely different—something "of this kind" will come. When and where and in which dimension nobody can predict exactly, but cryptocurrencies, blockchain and smart contracts will shape the future of our financial world and furthermore control and manage other areas of life and politics, also with the help of artificial intelligence. How will this impact on us, our society, politically, socially, monetarily and economically? We would like to probe these points in this concluding chapter. And indeed beyond the financial sector.

Monetary, fiscal and economic levels

Presumably, the monetary system will change drastically first. The financial world will be a pioneer for other sectors, similar to the military. Most innovations for blockchain and smart contracts are in financial products and services. Here, processes

and technologies are executed on a grand scale, and it is the big testing ground for applications elsewhere. The financial industry has long been digitised on a large scale—and has been for decades, depending on the state of the art. Internal and external communication systems have long since been electronically organized, despite cash and, until recently, paper transfer slips.

We believe that this will change the way companies manage their money processes: bookings, audits, accounting, balance sheets, profit and loss accounts, the entire accounting system, internal and external audits, business reports and last but not least the calculation, processing, payment and verification of taxes. Every financial transaction and the entire documentation system will be revolutionised by blockchain, smart contracts, artificial intelligence and machine learning, and thus drastically simplified. Of course, there is already an abundance of electronic and digital processes here today, no question about it. But often there is still a manual booking, a paper receipt or an appraisal by a person behind it who puts a tick somewhere.

In this context, not only the purely financial processes are changing. With smart contracts, the practical legal framework is also given a new contractual law mode—which, however, still has to be developed to such an extent that it can also be used in court. We are still a long way off from this. Corresponding laws and agreements—which must in any case be international—are at present nowhere in sight.

Payment processes, i.e. the effect of means of payment, the settlement of invoices and due dates, can take place within seconds. The situation is similar with taxes. Admittedly, not an argument to promote and popularise a system, but they are the basis for the functioning of a state as well as for our great idea. In addition, you can tax in a more differentiated manner—based

on intended use, product groups or the like—with drastically reduced administrative effort.

Tobin Tax and crypto-gas

Many of you will know the so-called Tobin Tax, proposed to tax international capital transactions. The motivation for this invention was a purely political one, namely to make foreign exchange transactions more expensive and thus to make currency speculations less attractive. The profit margins on short-term currency bets are very low and only worthwhile with a high capital outlay, so that even a supposedly minuscule tax would consume the profit and thus make the proposition impossible. Today, the Tobin Tax, which has not been introduced anywhere—because it only works by mutual agreement and on an international level—is a synonym for the taxation of money flows of all kinds. It is thus strongly influenced by ideology, comes predominantly from the left and is hostile to the economy—even if its protagonists act for supposedly noble reasons. The idea of the American economist of the same name dating to 1972 was revived in 1997 and led to the founding of the globalisation-critical initiative Attac.

A resurrection of a completely different kind, real and practical, has now came about through cryptocurrencies of all things, especially Ethereum. There is actually a kind of Tobin Tax here, namely in the form of the above-mentioned "gas". Gas is the fuel that keeps the network running, and fees are charged for every transaction in connection with this fuel. They are paid to whomever who creates the Ether (i.e. the Etherum currency unit) or confirms operations. The amount is small, but is payable with each transaction. This will enable the development,

maintenance and operation of Ethereum and other cryptocurrencies that follow a similar gas concept.

Our Utopicash should, as described, be as simple and "tax-free" as possible. Only the purchase of goods and services should be subject to VAT, which is thus collected automatically in a similar way to the "gas fee" for Ethereum and Co. Since cryptocurrencies have been in existence, this has been functioning flawlessly there. We therefore see scientific proof that this automatic method of financing is feasible. Admittedly, this tax is not to be one of many or a new tax in our endeavour, but should rather replace all others and tax the respective process as if by itself.

Political level and public domain

The state will be able to control its affairs through a dashboard. This may sound utopian at first. But ultimately, it is nothing more than a radical simplification of the previous principle, in which the state implements things from the legislature as executives. Only that it currently uses a huge apparatus with countless administrative levels from the very top down to the smallest community, whose units are not even coordinated. Exceedingly inefficient, extremely slow and just as sluggish at feedback. Conversely, this means that a blockchain system with live control, to which the entire population is connected, can immediately initiate things and implement decisions—after the head of state has signed the law or released it with their fingerprint, if necessary. The term "executive" will then be understood more in the sense of "implement", "execute" and "make" than as "administer".

At this point at the latest, it is inevitable that many readers may be saying to themselves: "This frightens me!", "I don't want

this!" or "This is too much for me!". We can understand such reactions and emotions very well. But we have a fairly simple and brief answer to this question: the state is already doing all this today, or at least trying to—just inefficiently and sluggishly. Our or another similar system would speed up the process and eliminate many authorities and officials who live on our fees and taxpayers' money. Entrepreneurs follow data, not opinions—and no matter how great the CEO ego may be, it submits to as a rule to the validity of clear facts. At least the basis of decisions will thus become better in the long term. Whether and to what extent actions are simply executed, only the future will tell.

In real time, the state could then also recognise the effects and the state of its community. But it could just as well examine the situation of all connected sub-areas: Which health services are in demand? Have cancers increased (deduced through relevant treatment services being paid for)? What are the most common drugs, and what are the relationships between individual diseases? Utopian? Pie in the sky? No, not at all. Denmark and Australia already have this complete insight into all details and processes of the healthcare system, including all patient data, doctor's appointments and prescriptions. Of course, not in real time, and the data must also be linked in each case, but all this is already being practised and recorded in full. And data protection is being adhered to in the strongest possible terms in these two countries. Harsh punishments loom over anyone who violates it. The systematic evaluation of health data—to improve the health system, scientific findings and the introduction of personalised medicine—has long been possible there. (All these elements would, of course, also be core elements of the "brain of Utopicash".)

One, possibly *the* pioneer in the digitalisation of its state and bureaucracy is Estonia: the state even introduced digital citizen-

ship three years ago. It is, to be sure, not genuine citizenship, but this virtual community can undoubtedly be a first step towards it. With this e-residency and a digital ID, even foreigners, especially entrepreneurs, can use some services. One can apply for digital citizenship online for €50. After successful verification, you can pick up your smart card at the nearest Estonian embassy. The card contains a digital signature with which bank accounts can be opened, contracts signed or companies established. In the spring of 2018, the small country was already able to report 30,000 e-residents. This would correspond to a population growth of more than two per cent.

Estonia is already very advanced in digitising its administration and citizenry services, partly because citizens and the media are open to the whole concept. Estonia has digitised all administrative procedures—everything for which personal appearance is elsewhere obligatory. Complete data exchange between citizens, companies and authorities runs via the decentralized computer system "X-Road" (which is also used in other countries). Here, too, hospitals are connected to the system; everyone can view their medical records.

The whole of Estonia is therefore organized on the Internet, including voting in parliamentary elections. As for e-residency, the identity card contains a chip with which every citizen can identify him or herself, view documents and sign digitally. Only three crucially important processes are excluded: marriage, divorce and real estate business.[223] This is probably how the most developed digital state emerged, which likely does not collect more data than other countries—but rather is able to link them sensibly, evaluate them and draw future-oriented conclusions from them. Presumably even with a higher degree of data protection, since nothing will be left to rot in the archives of remote

municipal or registry offices. No question about it, small states have it much easier—especially since they usually have a centralized state without provinces, states or other such regional divisions. This is another reason why they are the ideal area for pilot projects or even mature solutions.

Here, the permanent feedback, earnings evaluation and possibility of improvement are other great advantages of blockchain technology. Its "politics", content, settings or services can always be adjusted. Applications created at the drawing board are in this way continuously perfected in the trial process. Finally, what was said by LinkedIn co-founder Reid Hoffmann applies here: "If you are not embarrassed by your first product, you have probably entered the market too late." The idea behind this sentence is of great significance: regular feedback from users or the analysis of effects and data promotes excellence, which is at least the basis of decisions that can be repeatedly readjusted.

Back to Utopicash. In our system, a state would also see what educational grants are spent on and what sums people put into their savings accounts. Of course, it must be ensured that it is never possible to examine the individual citizen, but only to look at aggregated data. But the state, and also every interested citizen, can see the condition of its citizens, its country and the consumed products or state services in live time—and take counter-measures if necessary. The tax on tobacco products could thus be increased in no time at all—and so could water charges in a hot summer, at least where there is a threat of groundwater scarcity. At the same time, VAT could be lowered because an economic downturn is looming in the system, and the taxation of language schools could be abolished altogether. None of these are political preferences and statements from us. The examples are only intended to show how live control can work.

The great thing about it is that a state will see the consequences of its actions much more quickly. It has immediate insight into data, facts and figures, i.e. comprehensive statistics, and can draw conclusions from them or put them up for debate or even to a vote. Referendums would be in this way easy to hold, whereby here, as with all other aspects, sensible rules would have to be put in place to prevent abuse. Corridors or continued representation by parliamentarians would be possible here. Otherwise, the populace would possibly abolish taxes and thus the financing of the system altogether. Grassroots democracy would be technically possible without further ado; we doubt whether it would also be politically and objectively wise to extend this to all areas, moreover without restrictions. In essence, however, we want to present the possibilities and, above all, the technical possibilities here; we are however fully aware of the state policy backdrops and implications.

The state—and the entire economy and processes in all areas of life could benefit from this system—can instate/use this executive function. Here, we would again like to summarise the possible functions and results, and they would be stupendous:

- States could be controlled in real time via dashboard.
- Live errors could be corrected.
- Iteration could also take place in live time and on a continuous basis, i.e. the process of frequently repeating the same or similar actions—in order to come closer to a solution. This also raises the highly political question of the legislative periods, which are mentally and intellectually restrictive, as it is often only a matter of re-election and the 4/5 year cycle. So possibilities, committees or forms of representation should be found which, despite

the permanent possibility of referendums, do not forget the medium and above all the long-term perspective. In addition, it should be clear that a state and its parties and people's representatives who support it will not simply give up their power. In any case, we see democracy strengthened by such processes. Incidentally, in an increased form, we could even imagine that politicians would no be longer elected, but rather parameters or settings, i.e. concrete, measurable and also "adjustable" measures. The will of the electorate would then be implemented in a direct and unadulterated form, without its being dependent on politicians keeping their promises or seeing said promises abandoned for questionable and often inappropriate deals.

- The exact control of resources and the definition of transmitters and receivers would now be much easier.
- Subsidies and other forms of support would hit their targets precisely because, among other things, they can only be spent for their intended purposes.
- Shrinkage would no longer exist in the social security and educational system.
- The entire public sector would be put on a completely new footing—and above all, one supporting fewer legs.

Social and socio-political level "the people"

In essence, our idea is about two things: the more professional management of the administrative part of our modern life and an unconditional basic income. The two do not necessarily belong together. But as shown above, almost all ideas of an uncondition-

al basic income suffer from the fact that the financing is not secured. We have described solutions for this and also a system that can manage it and, above all, fine-tune and counteract it.

What does an unconditional basic income do with people? Many believe that a regular income without any necessary consideration would make people lazy. They would put their hands in their laps, nobody would work anymore and the whole beautiful construct would quickly collapse. This may apply to a certain part of people—but by no means to all. Because on the one hand, it is only a basic income, one which won't enable anyone to take any great leaps. In our opinion, most of the "participants" would still have a job and earn something, or at least earn a bit on the side. Some would not hesitate a second and continue their work cheerfully, while others, on the other hand, would finally devote themselves to what they really enjoy. What they would all have in common is self-determination. Of course, it would continue to be important to keep our lives going with all the amenities, services, products and innovations, not to mention so-called unloved but necessary activities. This would also happen, presumably regulated by the price, i.e. the wage. In addition, our "management system" would immediately recognise the source of the problems, i.e. which occupational groups were currently lacking, and could take counter-measures. Of course, these are all nothing more than ideas at this point. The practical proof has not yet been provided anywhere, even though there have been and still are pilot projects. In the process, it will be possible to collect valuable experiences, above all also over the presumably barely changing "nature of humans". However, temporal and above all numerical limitation is the big deficit of such actions. Only a small group is participating and therefore the consequences for an entire community cannot be explored.

DIE WELT writes: "Opponents and supporters also have heated debates. For some, the basic income is a promise of salvation. For others, it means the end of the performance principle and is considered barely affordable."[224] But the daily also sets out the economic context and the possible need for new ideas: "In the industrialised countries, digitalisation is fuelling the debate. It is about robots that replace people as workers, about computers that trade stocks, and about algorithms that control chatting with customers in service centres. What then happens to the people who are no longer needed as workers? Whether newly emerging occupations will cushion the development is disputed. And where work—as is the case today in some industries—does not generate enough income, sometimes despite several jobs, it is not enough to live on."[225] The paper also only refers again to concepts (due to there being no others so far) that require "taxes on stock exchange turnover or higher inheritance taxes", but comes to the conclusion: "Whether a basic income is regarded as a curse or a blessing also depends on the image of humanity: Does man strive for meaning and employment? Or does man need compulsion and pressure to remain productive?"[226]

In Finland, the arguably largest field trial, organized by the social authority Kela, is currently underway, with 2,000 beneficiaries and a budget of €30 million. The participants were drawn by lot. They are entitled to a basic income for two years: €560 a month. To live only on this amount or even feed a family, this should prove very difficult. But everything the recipients earn in addition—and they are not accountable to anyone—they are allowed to keep. This is one of the most important differences from previous social benefits of a Western character, which are generally credited—and would be eliminated if they were intro-

duced across the board. This amount, €560, is about half of what the Finn still considers poor,[227] although definitions of poverty are controversial and statistically often absurd. For example, according to a popular calculation method, moving a billionaire into a country would make all those who earn less statistically poor. And if everyone earns double in one fell swoop, poverty would not change. Because poverty is often placed in relation to society as a whole; not to what is needed for a life in dignity.

We have described the impressive advantages of Utopicash or Co. in the previous chapter. Coupled with an unconditional basic income, such a system would break the shackles that bind us to unbeloved jobs. At the same time, it is a way to get "leftists and neoliberals" together; after all, it leaves everyone an unlimited upward potential and secures by these mechanisms precisely the (social or even factual) peace that is needed to achieve such a potential. It would be a liberation and an enormous release of intellectual potential. It would not close the "gap between rich and poor" because such differences will always exist and are usually the result of performance, entrepreneurship or risk. The social consequences would however be significantly cushioned.

The social impact of the innovations will be considerable, the effect revolutionary. With Utopicash or others, one can set precise objectives. And if the unconditional basic income were introduced, work would no longer be a scourge. Rather, one would only do what one really likes and enjoys doing (when one chooses). Even corruption, which is not excessively widespread in Central Europe, would then disappear. Such control is also necessary from an economic point of view. This is because it boosts corporate and private spending, and thus consumption and investment.

Concluding thoughts and forecast

Above we have described a number of administrative procedures which today constitute the financial framework of a company and the administrative situation of our political system. Extrapolated to an entire economy, indeed the world economy, and to all areas of life where there are billions of routine "accounting processes", this is an incredible waste of human potential, manpower, resources, money and time. What can arise from this if all these potentials are released because the processes continue to run smoothly even without human intervention? Today we are faced with an uncreative, useless, unproductive self-administration of our lives. All these accountants, tax advisors, tax auditors, appeals specialists, cashiers, bankers, civil servants—our administrators—would naturally be the first to lose their jobs. But there will be something new for them, because they have an excellent education and qualifications. And there have always been changes. 150 years ago, the majority of the workforce in today's industrialised countries worked in agriculture; today it is only a fraction. And yet we still get enough to fill our bellies, and still have beyond that enough to export.

Blockchain processes are based on automatic execution. They cannot be manipulated. Control must however be decentralized, transparent and comprehensible. That is the crux of the matter. In such scenarios, for example, many have at least moved away from their fear that their identity could—technically speaking—be obliterated. If only one or a few people have their thumbs on the data and the overall system, this is of course possible—but not if it takes place decentrally with a multitude of legitimations of the respective "booking process".

Therefore, clarification is important. And we have to start on a small scale, set up testing grounds and pilot projects. Let us imagine for a moment the enormous and unproductive routine administrative process when we enter a hotel or the branch of a car hire company. The hotel operator or owner of a rental car company has a legitimate interest in knowing who is behind the hotel guest and the hirer of the car respectively, and whether the latter, for example, has a valid driving licence—but by means of blockchain and modern media, he will learn this in an audit-proof manner. Except we won't have to queue anymore. Some hotels already exercise an online check-in today. But this is only the beginning. Ideally, there will be also no check-out any more, but automatic billing. The basis of the whole thing is of course trust—and a technical solution, for example with an RFID chip or something similar. It needn't always be a blockchain. And at best, the hotel will not pare down on the people who stood at the reception, but let them take care of the guests' more vital concerns. You see, they will have more time for such things now.

Which of the suppliers will win the race? Private sector, open-source or the state? We cannot answer it from today's point of view. But everything is unfolding in this field of tension and with these players. What will be crucial is that the separation of powers works, so to speak. Just as there are the legislative, executive and judicial branches, there must also be similar pillars in economic life or even in the issue of a cryptocurrency. The provider must not rule alone, but the—ideally—billions of members of its ecosystem who confirm the decisions and processes. All this will speed up our lives, but hopefully not as in the example of German supermarkets, where some chains accept Google Pay as a means of payment, thus accelerating the process—and consume

the time saved by asking customers whether they want to withdraw cash.

We had the Industrial Revolution. It freed most of us from working with muscle power. Now the next revolution is coming. It is starting in the financial system and will not leave no stone unturned, subsequently spreading to other areas. Blockchain is restoring our time and potential—which we can use for other, better and more creative things.

And what are the success factors for future financial products? Well, the be-all and end-all is easy accessibility. In the past, services were only available locally. Then it was all "nation-driven". This applies to some extent to this day, in particular to the banking services used by customers. But other than that, there are monetary unions, credit cards and money transfers. In interbank transactions, everything has long since gone global, and the major financial centres of New York, London, Frankfurt, Paris, Singapore and Shanghai have also been geared towards this. Today, the system is central, but riddled with certain hurdles for customers—which one first sees when one realises that not everyone has access to it. One needs an account and of course Internet and electricity, to name just a few, while illiteracy and other social factors are enormous and usually insurmountable obstacles. From a purely technical point of view, however, the global networking of banks' infrastructure and B2B business could already pave the way for far-reaching access for new target groups—whereby the availability of the Internet is certainly one of the most important prerequisites.

The second important success factor for the financial world of tomorrow is the comprehensibility of the offer. Financial products have to be made as simple as possible. Many things today

are far too complex, not only in the customers' operation, but even in the hinterland of banks.

The third crucial point is the necessary transparency, even behind the scenes. The financial system today is much too confused, the mechanisms for most spectators inscrutable to absurd. Above all, this is also a socio-political problem. This is another reason why blockchains are the key to the future of finance, because everything here is comprehensible and open. In this way, it is interesting to note that trust in individuals or institutions is no longer necessary. Because one can be sure that everything works. After all, everything is visible and stored in multiple decentralized locations.

Of course, cryptocurrencies must become more stable. If, for example, one wants to fix retail prices for goods and services in this area, the value must be reliable and must not be subject to such huge fluctuations as in the recent past. With Bitcoin Cash, Ripple or Stellar having these features, a hopeful start has been made. This is the only way to make it possible for cryptocurrencies to be accepted at the point of sale. For this, we need such stable coins that are pegged to the dollar or the euro for the foreseeable future. For as much as we desire other currencies and have described the inadequacies of fiat money in detail in this book, it is unrealistic that the world's leading currencies will soon be superseded in their dominance and pacemaker function. It is more likely that we will see blockchain variants of state currencies. Although cryptocurrencies are technically the future, they are currently not an anchor of value. From today's perspective, they would lack the broad acceptance that official currencies still have.

Cash, however, is likely to disappear in the medium to long term. It is no longer up-to-date. In addition, its handling is too

costly and cumbersome, even from a private point of view, with trips to the ATM and constant peeks into one's wallet to see if there is still enough there. The few advantages of cash lie in its anonymity and independence from electricity and the Internet, which could be important in the event of a major power outage or large-scale hacker attack. The financial sector is truly dependent on functioning IT. Numerous cyber-attacks have shown how vulnerable IT systems are. This unbeatable advantage of cash must be weighed against the disadvantages and costs, if one is dependent on it at all. In the end, it is the customers—in addition to the governments—who have to decide. It is their business to recognise what is most suitable and most favourable for them. If electronic payment procedures prevail, it is likely that it will at some point no longer be possible to maintain the customary infrastructure at a reasonable level, as in Sweden.

It is also conceivable that the many small fragmented national currencies will be abandoned and only the large or stable ones will survive. However, this would have an impact on the associated national economy, which may be less competitive because the state lacks the instrument of devaluation; an argument that was often put forward during the euro crisis in relation to Greece.

In general, however, new offers are only accepted and come to prevail if they solve a problem and offer added value. Other solutions will only disappear if there is no longer a need for them. For this reason, the number of means of payment has increased with each innovation, without any significant methods having been omitted. Even cheques still exist; they even continue to play a relatively large role in the USA.

Blockchains will first experience a breakthrough in supply chains, in logistics and process optimisation, i.e. in the busi-

ness-to-business sector—before comprehensive solutions are established for the private sector. Transferring money in real time is the most popular application today. However, broad applications are still pending, especially for smart contracts. What would be the biggest use case? Certainly the complete governance of a country by means of blockchain—similar to our proposal. But this will take at least another ten to 15 years. This would then go hand in hand with the liberation from nonsensical, valueless activities. Furthermore, it is conceivable that cryptocurrencies may exist for individual areas, for example for travel or asset optimisation. Here too, however, value stability is critical, both for customers and for companies.

Bitcoins, on the other hand, will not be the future; the processing is too power and cost-intensive, especially since bitcoins is only one currency and therefore only covers one aspect of blockchain. But its icebreaker function was extremely important—and the currency still profits from it today, also because many people believe in it. But it is already a dinosaur. Bitcoin arose out of the plight of the market and also in response to the crisis. This and the creative forces of the market coupled with innovation show that independent alternatives with revolutionary perspectives always form on their own alongside the establishment. No one called for bitcoin, yet bitcoin/blockchain is a response to a need, a problem. Of course, the attention directed at cryptocurrencies has risen notably through bitcoin, which in our opinion will develop into a mass movement and beyond that hopefully up to a critical mass. Regulation is extremely important to achieve mass viability and genuine democratisation.

But why banks are still needed for everything, that is something we really couldn't tell you.

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