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The financial markets in changing times
Changes today and tomorrow: the digital future
Money Market Event

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Ladies and Gentlemen

In his speech, my colleague Dewet Moser has demonstrated how being open to innovations can pay off. However, he also underscores the point that it is entirely appropriate to carefully examine their purpose and the benefits they offer. I would now like to apply this scrutiny to the fintech innovations that are currently attracting a great deal of attention among the general public and in the financial industry.

Bitcoin is one of the most talked-about topics at present, and the hype that has built up around cryptocurrencies in general is considerable. It is estimated that well over 1,000 of these currencies are in circulation today. If you search the internet for the word 'bitcoin' you will find more than 300 million entries. By contrast, the term 'Swiss franc' generates just over 30 million hits. Furthermore, bitcoin has a very modest market capitalisation by comparison with conventional currencies and investments, as we can see in the left-hand chart on the **slide 1**. This highlights the marked difference between the level of public interest and the actual use of cryptocurrencies.

Alternative private currencies are nothing new. We need only think of WIR money, or regional currencies in French-speaking Switzerland such as the léman and farinet. In the digital era, such currencies can be created more or less at the click of a mouse. Despite their name, however, cryptocurrencies are not comparable with money – far from it. Money has to fulfil several fundamental functions. It should serve as a viable medium of exchange in the economy, that is to say it must be widely accepted as a means of payment. It also has to be a stable unit of account for the value of the goods and services that are exchanged. And it should also be used as a long-term store of value, for example for saving. Cryptocurrencies such as the much-discussed bitcoin do not perform these functions adequately, if at all.

Trust is the very essence of a stable currency. This trust cannot evolve without a solid framework, including a state governed by the rule of law, a sustainable economic and fiscal policy, and also an independent central bank. Cryptocurrencies that have no link to a conventional currency (the Swiss franc for instance) display a high level of price volatility. They are more of a speculative investment instrument than a means of payment capable of retaining its value. The chart on the right-hand side of the slide illustrates this. Compared with exchange rates, commodities and equities, cryptocurrencies are subject to very high volatility, and investors must be aware of the financial risks they are taking on when buying them.

Cryptocurrencies therefore do not meet the requirements of a currency. However, this does not mean we can simply dismiss them out of hand, for behind all of the hype there is an array of technological innovations. Particularly important among these is the distributed ledger technology, known as DLT for short and often also referred to as blockchain. In other words: it is important to make a clear distinction between cryptocurrencies as assets, and the underlying technology, which does indeed have potential.

DLT could facilitate solutions in various areas of the economy that would enhance the safety

and efficiency of digital information flows. A distributed ledger is essentially a decentralised and synchronised database that allows participants to read, write and save information. DLT makes it possible to unequivocally define ownership structures within a computer network, without the need for a central third party. These facets also give rise to interesting possibilities for the financial sector, and DLT is therefore regarded as one of the biggest innovations in the fintech area.

Today I would like to look at the effect fintech innovations could have on a key element of the financial system, namely the financial market infrastructure. The financial market infrastructure, FMI for short, comprises trading platforms, securities settlement systems and payment systems via which financial transactions are conducted electronically. The FMI is generally not in the spotlight. Nevertheless, both the financial sector and the Swiss economy as a whole depend on a secure and efficient FMI. The SNB monitors developments in this area very closely given that facilitating and securing the operation of cashless payment systems is one of its statutory tasks.

In this speech I will be discussing the significance of fintech for the financial market infrastructure. First, I will address DLT's potential in the FMI. Second, I will be talking about the tried-and-tested division of roles between the central bank and commercial banks. I will look at how this two-tier system paves the way for harnessing fintech innovations that could enhance efficiency, while ensuring that this is not to the detriment of either safety or reliability. Third, using the example of retail payments, I will show that there is a lot more to fintech than just DLT, and that private sector players are much better suited to providing timely solutions and flexibly addressing the needs of customers in this area. And finally, I will take a brief look at digital central bank money for the general public, a subject currently generating a lot of debate, and will outline why there is no need for it if the system for cashless retail payments is efficient and innovative.

The potential of DLT for the FMI

So let me begin with the potential that DLT has to offer for the FMI. The FMI is the bedrock of our financial system, facilitating the reliable transfer of securities and money between buyers and sellers.

The **slide 2** shows a simplified FMI process chain for the settlement of a securities transaction. Transactions are first made via a trading platform, for instance a security is bought on the Swiss Exchange. This purchase is then cleared and settled. Security and money are simultaneously transferred between buyer and seller. In Switzerland, this takes place via the securities settlement system SECOM and the payment system Swiss Interbank Clearing, or SIC for short.

It is entirely possible that distributed ledger technology could take hold in various fields. I would like to look here at two possible areas of application: securities settlement and cross-border payments.

One of DLT's key characteristics is that it makes verified information available to a large number of parties simultaneously. It is therefore particularly appealing in the case of complex processes where coordination is required across a whole range of participants. This is the case in the securities business, which comprises a network of many different participants trading, settling and managing securities. Examples of these market participants – brokers, banks, settlement service providers and custodians – are shown on the **slide 3**. With every transaction, a wide array of booking information has to be reconciled bilaterally between the parties involved (**slide 4**). For example, banks have to reconcile and monitor their securities holdings at custodians against their own internal accounts. The coordination requires considerable effort, which in turn leads to high operating costs. DLT could help in this regard by ensuring that all of the involved parties have the same information at the same time. The **slide 5** illustrates this step. Thanks to the synchronised distribution of information, the aforementioned, highly complex reconciliation would no longer be necessary.

The potential for efficiency gains is indeed considerable, which is why extensive research is now being conducted in this area. And innovations that enhance the efficiency of the financial system or the economy as a whole are certainly worthy of closer inspection. The Australian Securities Exchange ASX, for example, has recently announced that it is to use DLT in redeveloping its core system for clearing and settling of equity transactions and recording shareholdings.

In addition to the securities business, potential uses of DLT are also being envisaged in the field of cross-border payments. The latter are slow, costly and lacking in transparency compared with domestic payment transactions, and so the potential for efficiency gains is particularly high. Certain central banks – those of Singapore and Hong Kong, for example – are now focusing on this, as are private initiatives. Should the anticipated advantages materialise, the attendant efficiency gains would be substantial. That said, for both of these potential applications there are high barriers that have to be overcome in order for new solutions to be implemented in practice and find their place in the market. The current ecosystem comprises a large number of stakeholders, who would have to adapt their systems and processes. The high level of investment this entails is curbing the pace of developments, as are the technical and legal questions still to be resolved.

Tried-and-tested division of roles between banks and central banks

What is the SNB's take on these developments? We welcome innovations that enhance the efficiency of processes. But while the initial experiments have been promising, there is still a long way to go before market-ready DLT solutions become a reality in the FMI. DLT has still to prove that the hoped-for efficiency gains can actually be delivered in practice. Furthermore, simply enhancing efficiency alone is not enough. Such gains must not come at the expense of the availability and resilience of the systems or the integrity of the data. This applies especially to those parts of the FMI that are systemically important. Here we set the highest of standards when it comes to stability and security.

The secure settlement of large-value payments is a prerequisite for the stability of the financial system. Financial transactions, which as a rule involve substantial amounts and are time-critical, are of great significance for the real economy. This is why it is so important to have the settlement of large-value payments as a reliable foundation.

To avoid risks with regard to payments in this systemically important segment, there needs to be a risk-free payment instrument. Today, time-critical, large-value payments in a currency area are therefore usually settled in central bank money and via central banks' payment systems, referred to as real-time gross settlement systems or RTGS for short. Switzerland's RTGS system is Swiss Interbank Clearing (SIC). An RTGS system ensures that payments are made when – and only when – there is sufficient money on the account of the paying bank. If there are adequate funds to cover the payments, they are settled irrevocably and in real time. This assures the safety of the settlement process. Using central bank money also eliminates the risk of default by the settlement institution. Central banks can provide additional liquidity if required at any time, and also serve as the lender of last resort. In this way, they ensure that there is a reliable foundation for the FMI. This has proved effective to date, and also stood up well during the financial crisis.

Could DLT also be used in RTGS systems in the future, i.e. as part of the reliable foundation? We see a number of questions that are still to be resolved here. The technology itself does not yet meet the requirements expected of the RTGS systems in terms of scalability, data security and reliability. Modern RTGS systems such as SIC are already demonstrably efficient and crisis-resilient. In this area, a payment system not only has to prove its efficiency; the reliability of the RTGS systems is also absolutely crucial for the stability of the financial system. New technologies therefore have to meet very high standards in this respect.

However, it is quite possible that DLT may take hold in other areas. If DLT were to become established in the securities business, for example, these systems would be linked to the reliable foundation in some manner or other. It is hard to envisage DLT-based system environments developing in isolation.

So the next question is what form the coexistence of new DLT solutions and conventional RTGS systems might take. There are different scenarios. One possibility would be a simple technical interface between the DLT system and the existing RTGS system, as illustrated on the **slide 6**. Payment instructions would be exchanged via this interface, in much the same way as the current solution between SECOM and SIC. However, direct delivery-versus-payment settlement would require certain adjustments, for example to the opening times and participant structure of both systems.

A second and more far-reaching possibility would be to integrate the cash leg into the DLT-based infrastructure. This could be achieved by having the private operators of this infrastructure issue a 'settlement token' on the DLT system, with the securities then being settled against these tokens. An initiative launched by a consortium with Swiss participation is working on such an approach under the project name 'Utility Settlement Coin'. This example shows how a market solution could ensure cash-side settlement of securities on the distributed

ledger. This scenario is outlined on the **slide 7**. Such a privately issued settlement token would be equivalent to commercial bank money, and fully secured by central bank money. However, it would also be possible in principle for central bank money to be tokenised for the settlement of interbank transactions. Central banks in some countries – Singapore among them – are conducting experiments to gain a better understanding of the associated risks. As you can see on the **slide 8**, this is similar in concept to the previous option. However, there are a number of questions still to be answered in this respect as well.

As you can see, there would be various forms that this coexistence could take. What is crucial is that the safety and reliability of the FMI be maintained. The central bank has an important part to play in the reliable foundation, that is to say with regard to payments in the RTGS system. Around this solid foundation, however, it is the market that has the main role. Here it is the commercial banks and other private sector stakeholders that choose the best technologies and solutions.

The division of roles between central banks and commercial banks results in a good balance between safety and efficiency. At the first level, the central banks facilitate the settlement of interbank transactions on secure systems and in electronic central bank money. In so doing, they minimise the risks in the systemically important segment of payment transactions, beyond which the risks can be borne by the market. At this second level, settlement can take place via alternative channels, without necessarily having to be based on central bank money. This division of roles between central banks and commercial banks epitomises our current two-tier financial system. In the first tier, the central bank acts as the banker to the banks. In the second tier, the commercial banks act as the interface to the end customers. And it is the competing commercial banks that decide which services they want to provide for companies and private individuals. This system is efficient and proven.

There is much more to fintech than just DLT

In connection with fintech, I have so far focused mainly on DLT. However, there is of course much more to fintech than just DLT. In addition to DLT, a whole array of promising innovations could potentially be applied to traditional financial services. We need only think of mobile payments, robo advisers, crowd lending or big data. The multifaceted interplay of ever greater processing power and storage capacity, together with the increase in the mobile use of services, are opening up entirely new business areas. This is also reflected in the large number of different business models currently represented in the Swiss fintech industry. The **slide 9** shows the different business models in Switzerland. Only 15% of the enterprises within this segment are focusing on DLT, while the remainder are spread across other fields of application.

One of the key areas for fintech is retail payments, i.e. payment transactions for companies and private individuals. A well-functioning system of payment transactions for end customers is a key pillar in any efficient economy. This payments area is undergoing a period of rapid technological change.

As with all fintech innovations, the primary focus is on the user-friendliness and speed of the services offered. Technological advances have led to marked changes in consumer expectations and requirements. Consumers want payment services to be ever faster and more user-friendly, and they want to be able to use them wherever they may be. End consumers these days are asking why it should take them longer to make a cashless payment than to send a WhatsApp message. As elsewhere, customers expect immediate service when it comes to payment transactions, and demand round-the-clock availability as well.

To satisfy these demands, fintech companies and banks are working on new solutions, such as new applications, functionalities and services. Examples include linking the payment application to retailers' customer programmes, or cross-institutional analysis and visualisation of end customers' payment data. Experiments are being conducted in China on linking face recognition technology and payment transactions, opening up the possibility of making payments in the future by smiling into the seller's camera. In this process of innovation, it is of course essential that the key questions relating to aspects such as misuse or criminal usage as well as the protection of customers are addressed effectively and coordinated internationally. It is therefore important that the same business models with the same risks be subject to the same regulation.

As part of its statutory mandate, the SNB also has a role to play when it comes to innovations in the field of cashless payments. Specifically, it is the commissioning party and system manager of SIC. At infrastructure level, the latter's function is to offer the most attractive framework possible for a cashless payment system that is fast and ensures high availability. The SNB works together with stakeholders on the ongoing development of the SIC system. One year ago, for example, the operating hours of this system were adjusted at the request of the participants.

However, end customers' needs in respect of payment transactions are best met by private sector solutions. Here, too, the advantages of the two-tier system come into play. **The slide 10** illustrates the point, taking payment transactions as an example. As I explained earlier, the SNB as the bankers' bank ensures that there is a reliable foundation for the settlement of payments. In the retail payments space, financial services providers use this as a platform for delivering their services to customers, doing so in competition with one another. Operating on these two levels, this system ensures that the financial sector remains agile and safe, and that the best ideas can thus take hold in the market without this compromising the systemically important segment.

Digital central bank money – few advantages, significant risks

Ladies and Gentlemen, before I sum up I would like to say a few words on the subject of digital central bank money for the general public. A more prominent role for central banks in the end customer segment is currently being discussed, involving this and other associated terms such as 'cryptofranc' and 'e-franc'. However, we are convinced that private sector solutions are better suited for meeting end customers' needs in this area. Digital central bank

money for the general public is not necessary to ensure an efficient system for cashless retail payments. It would deliver scarcely any advantages, but would give rise to incalculable risks with regard to financial stability by calling into question the tried-and-tested two-tier system. Instead of operating as the bankers' bank as it does today, the SNB would be acting as a commercial bank for end customers. This would exacerbate the threat posed by bank runs in times of crisis. Moreover, Switzerland would be alone in adopting such a solution: no other central bank has implemented such a solution to date.

This brings me to the end of my speech. Please allow me to briefly sum up the key points.

Conclusion

I hope I have been able to demonstrate clearly why cryptocurrencies are not genuine rivals to conventional currencies. That said, the underlying distributed ledger technology does indeed have potential, especially in complex areas such as securities settlement and cross-border payment transactions. Nevertheless, the technology still has to prove itself in practice.

As well as being efficient, DLT-based solutions must not give rise to any systemic risks in the financial market infrastructure. In the systemically important segment of cashless interbank payments, the SNB plays an active role by providing a reliable foundation. Any future DLT-based systems will have to be linked with the latter in some form or other.

In turn, in the area of cashless retail payments, the private sector is better placed to address customers' needs. The division of roles between the central bank (as the bankers' bank) and commercial banks (as the interface to the end customers) has certainly proved its worth over the years. This brings me to an important conclusion: If cashless payment transactions are efficient and innovative, there is no need for digital central bank money.

What is important is that we remain agile. Our existing set-up contributes to the stability of the financial system, while at the same time allowing sufficient leeway for innovation. This can be said of both the financial market infrastructure and the two-tier financial system as a whole. In safeguarding this stability, we should nonetheless remain open to new developments.

The SNB will continue to keep a close watch on developments to ensure that we are always able to assess their potential impact on the financial system in good time. Flexible and safe solutions often evolve from cooperation between market participants, regulators and central banks. So let us shape the digital future together.

Thank you for your attention.

The financial markets in changing times

Changes today and tomorrow: the digital future

Andréa M. Maechler, Member of the Governing Board

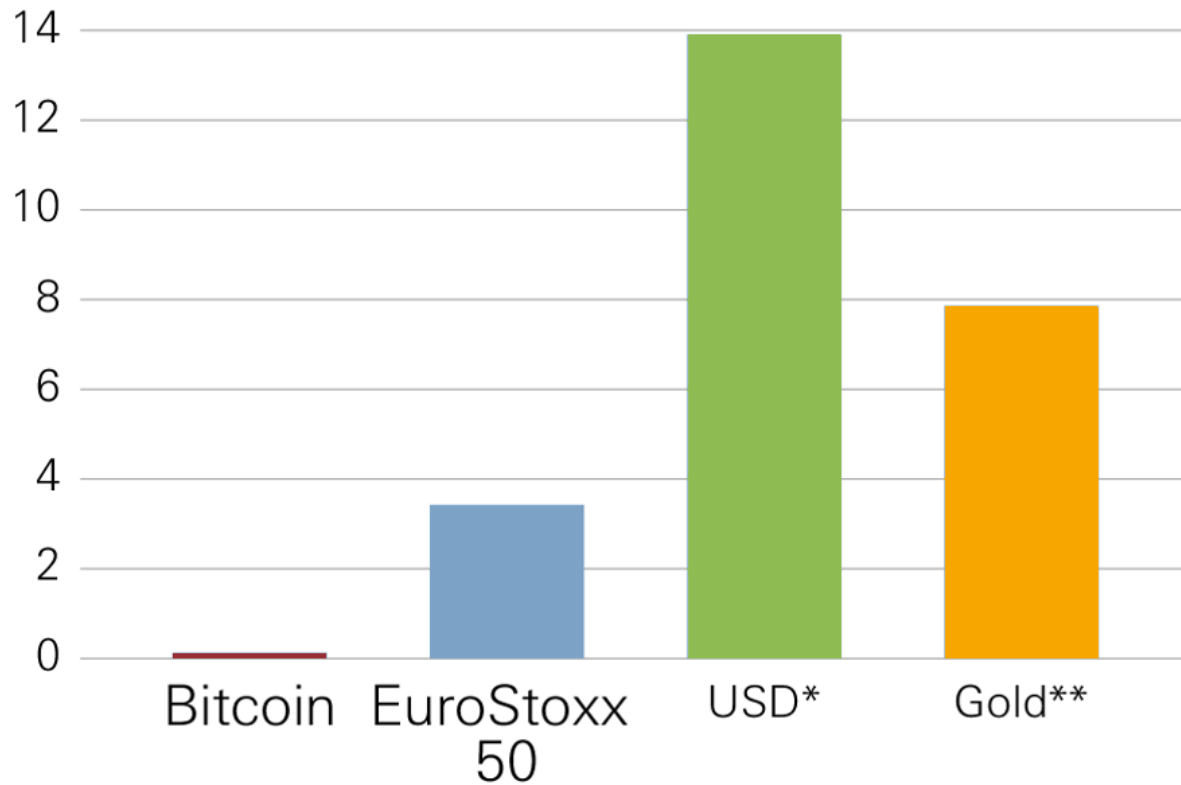
Zurich, 5 April 2018

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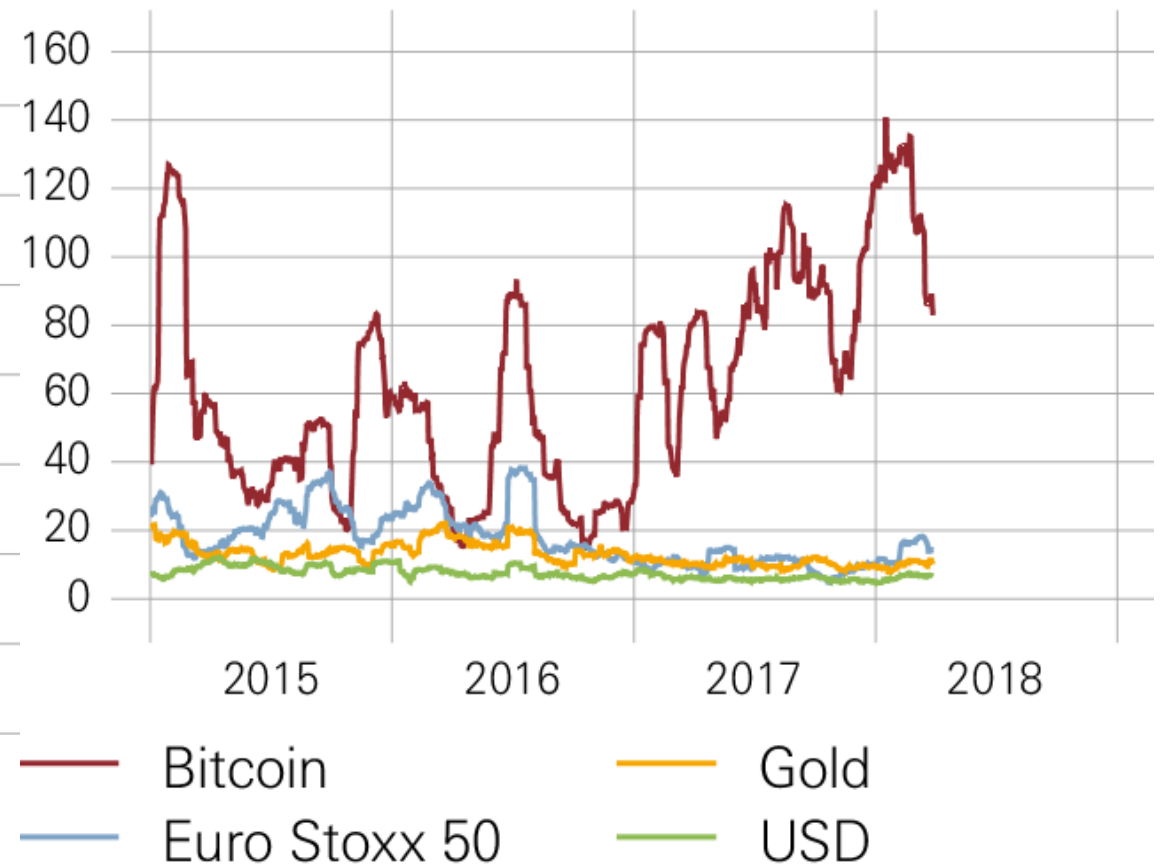
Cryptocurrencies: low market capitalisation, high volatility

MARKET CAPITALISATION

In USD trillions



VOLATILITY ***



Sources: Coinmarketcap.com; Bloomberg; FED; World Gold Council.
 * USD: M2 aggregate ** Gold: Market price of above-ground stocks of gold
 *** Realised 30-day volatility in %

Financial market infrastructure: bedrock of financial system

Trading platform
(Swiss Exchange)



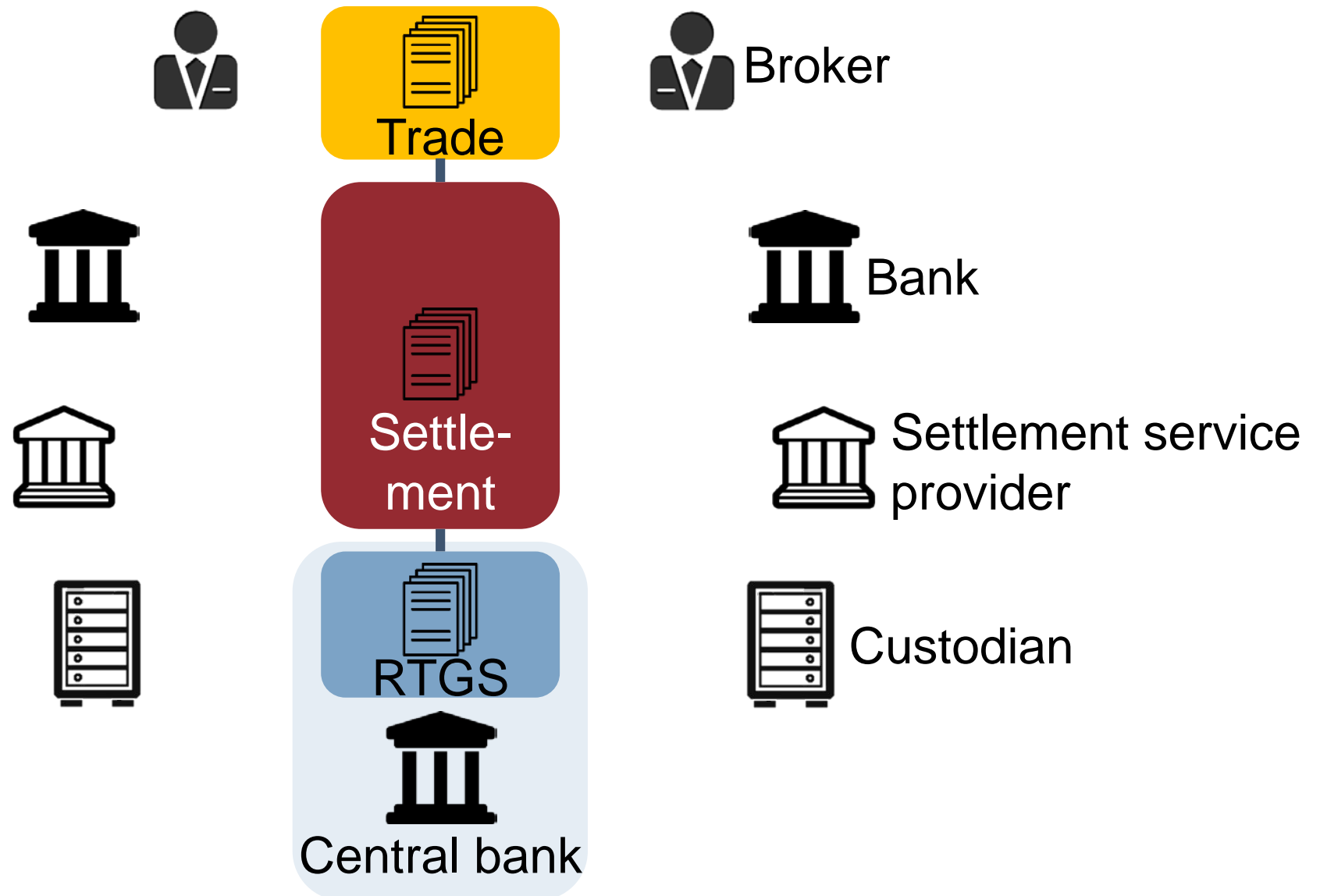
Securities settlement
(SECOM)



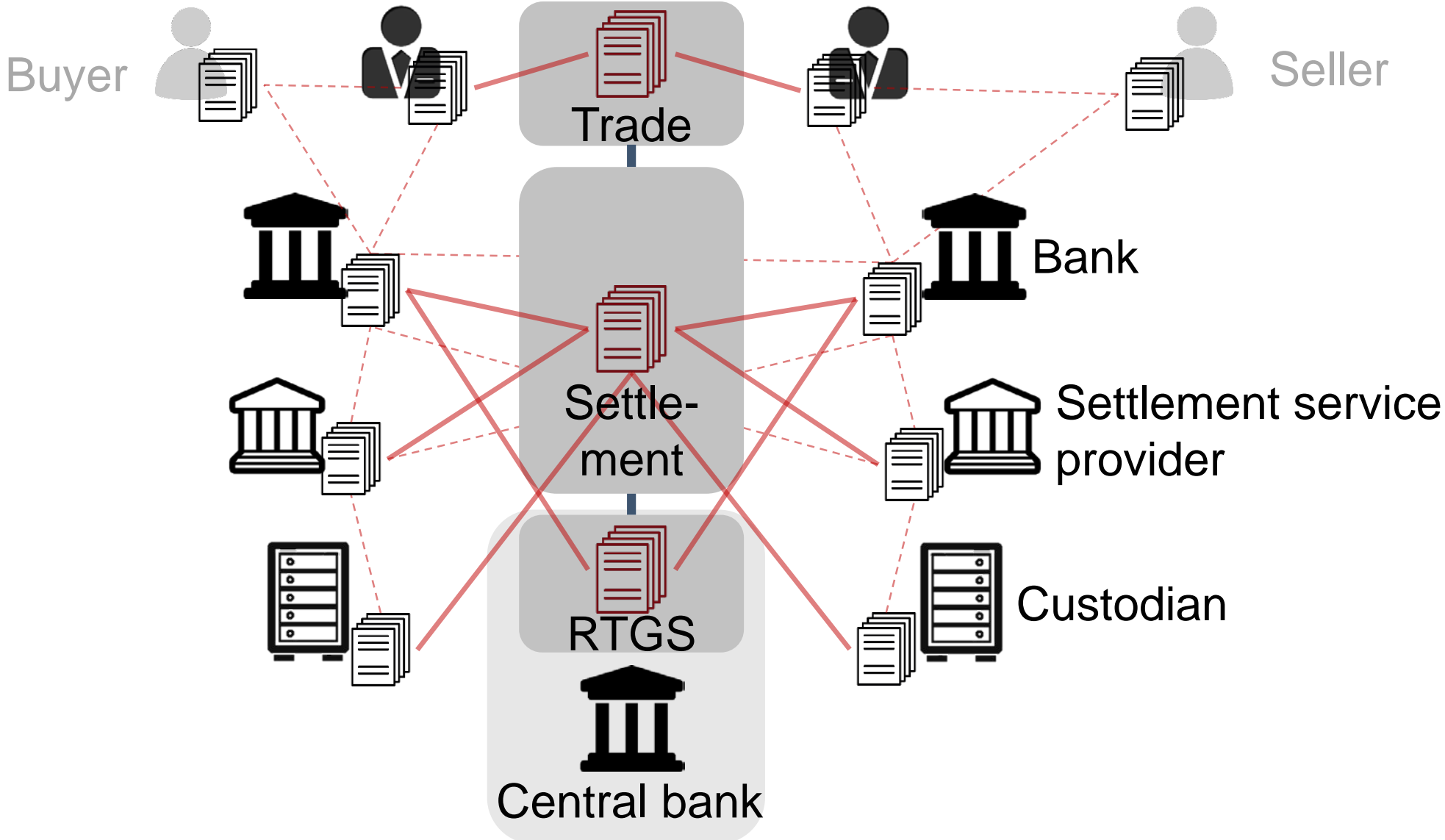
RTGS payment system
(SIC)



Financial market infrastructure: linking market participants

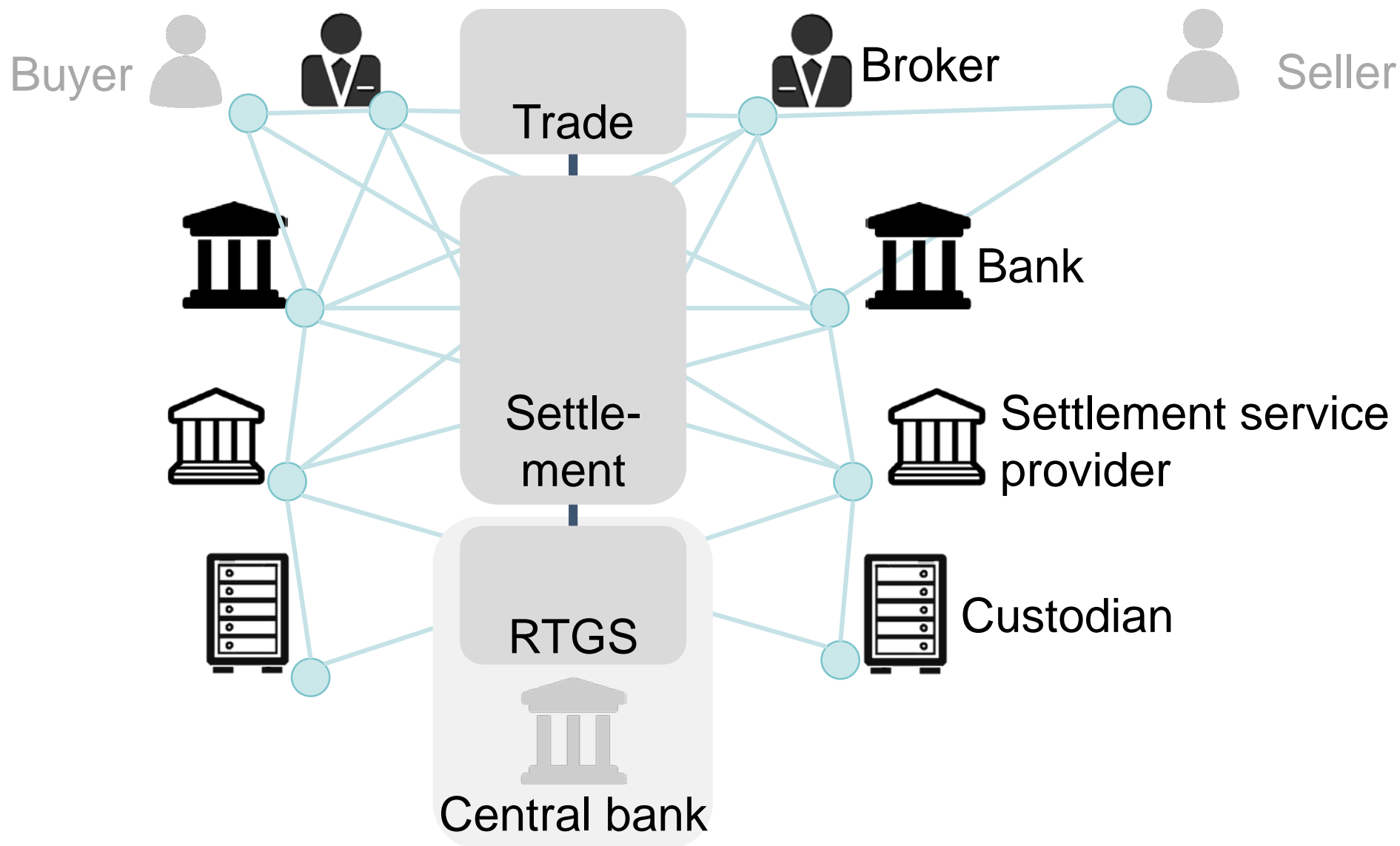


Today: complex **centralised and bilateral** reconciliation



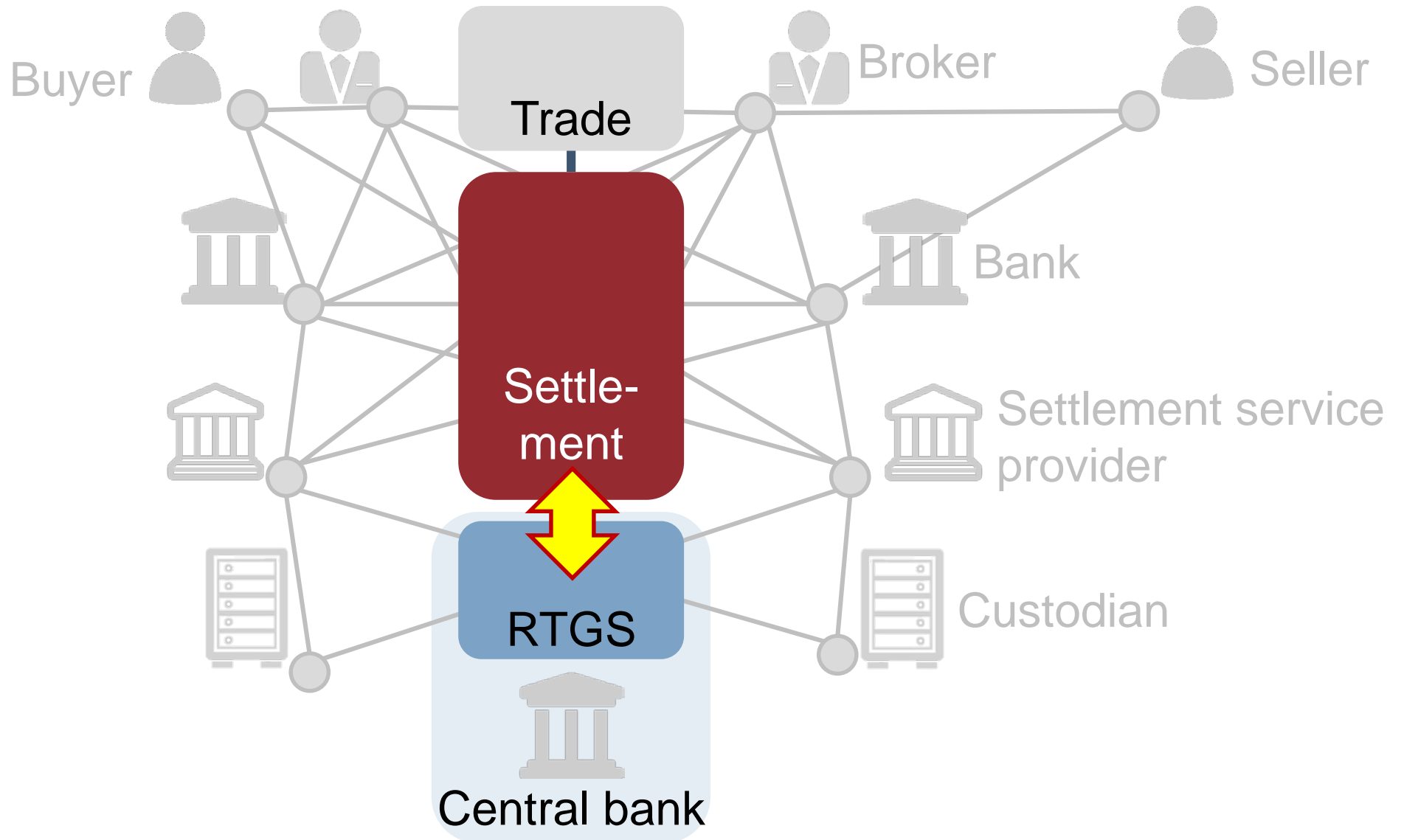
Source: SNB

DLT: decentralised and automated synchronisation

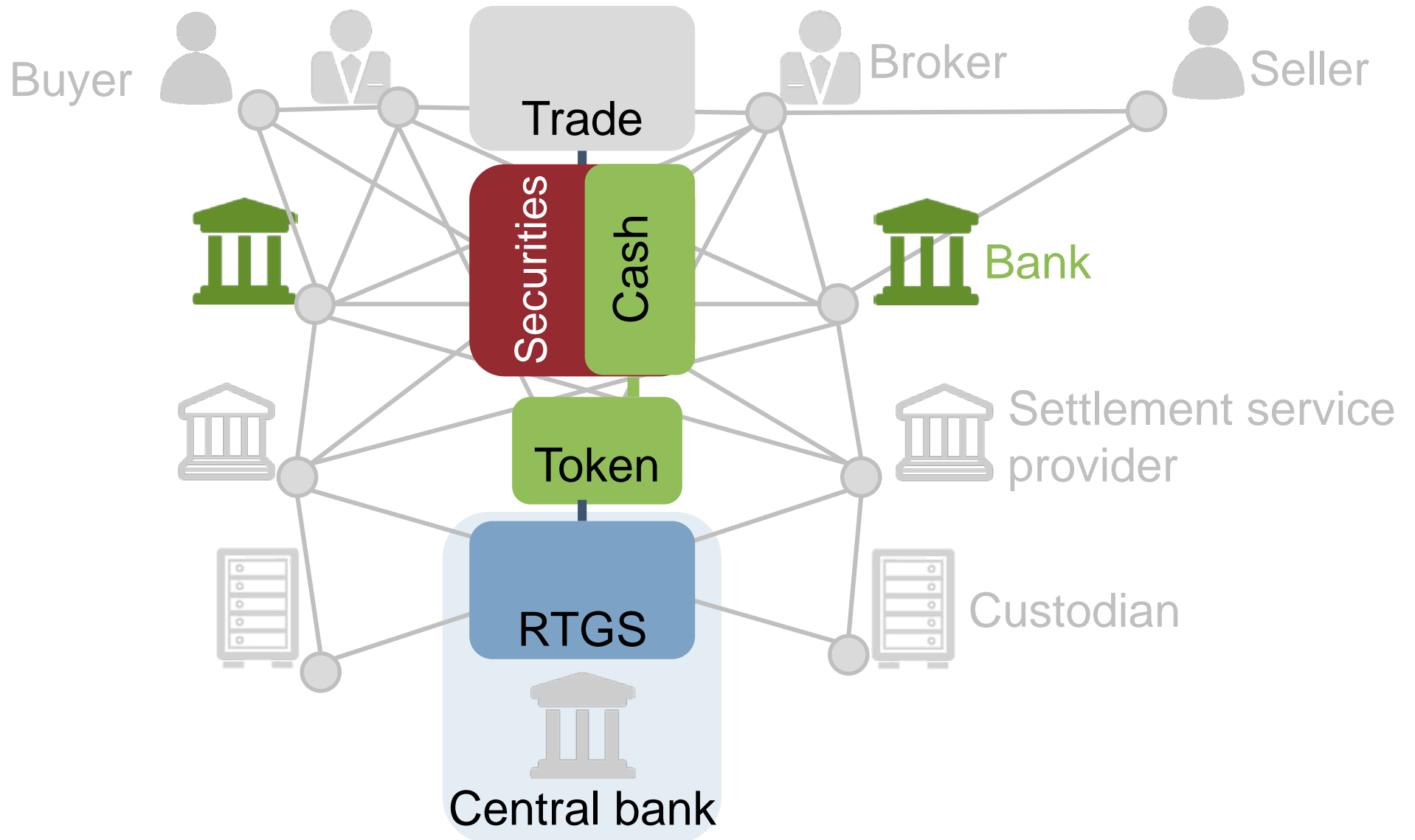


Source: SNB

Coexistence: message exchange via **interface**

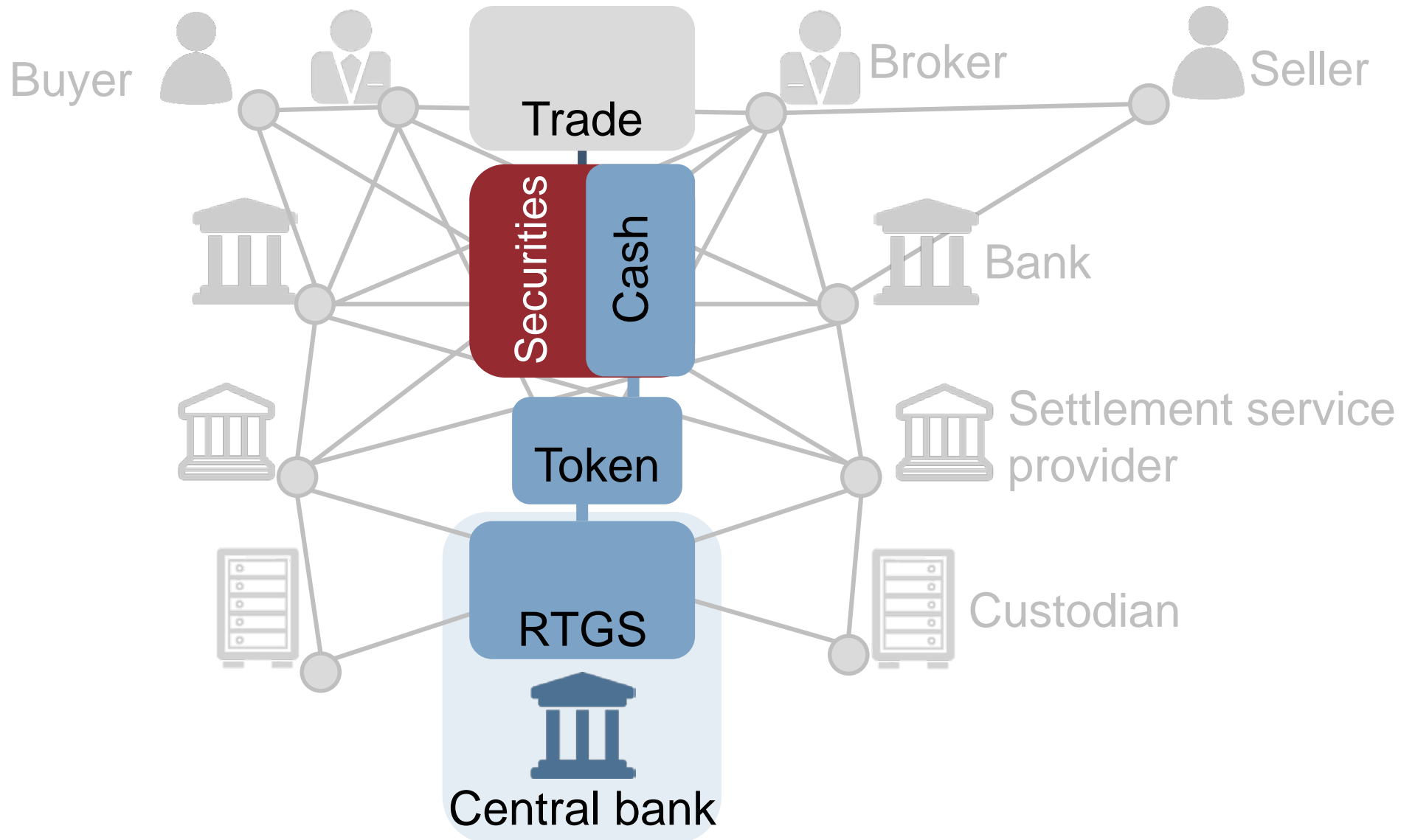


Coexistence: settling payment leg using private token



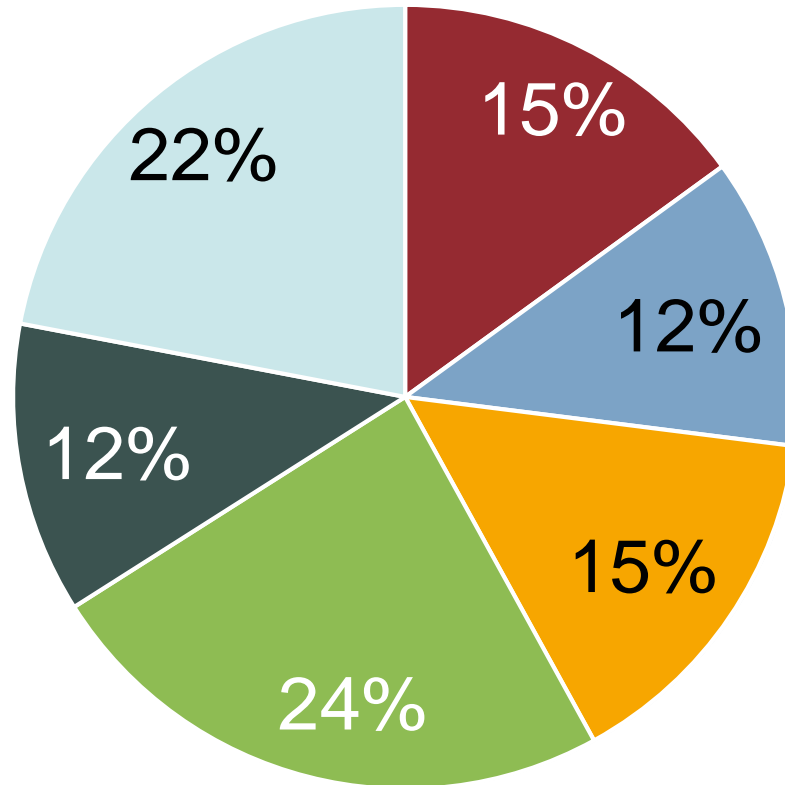
Source: SNB

Coexistence: tokenisation of central bank money



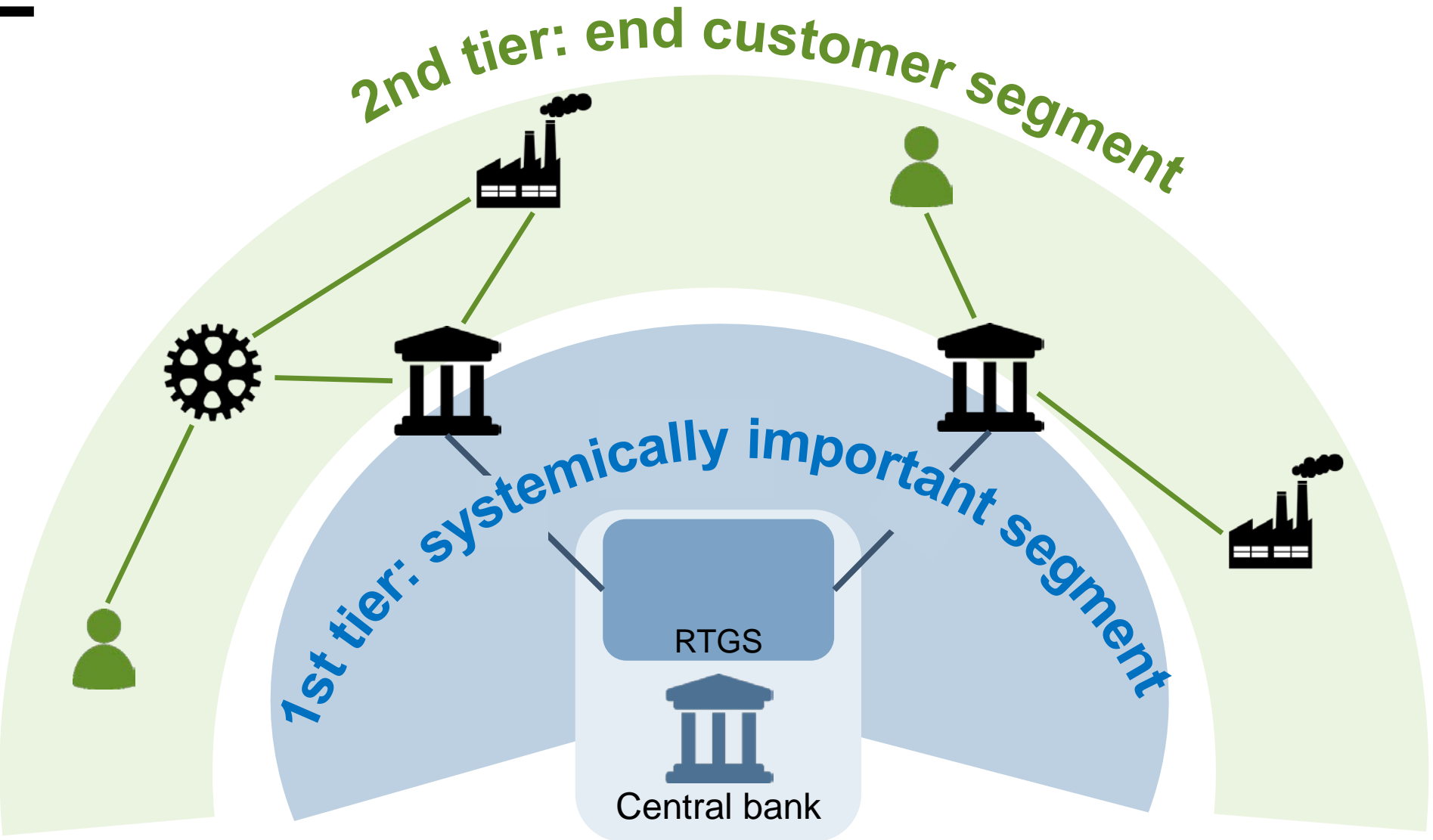
Fintech: more than just DLT

SWISS FINTECH INDUSTRY (220 COMPANIES)



- DLT
- Payments
- Deposits & lending
- Investment management
- Analytics
- Banking infrastructure

Two tiers: allowing flexible market solutions for end customers



Source: SNB

Thank you for your attention.

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