

# SPEECH



DATE: 08/12/2017  
SPEAKER: Governor of the Riksbank Stefan Ingves  
VENUE: Swedish House of Finance, Stockholm

SVERIGES RIKSBANK  
SE-103 37 Stockholm  
(Brunkebergstorg 11)

Tel +46 8 787 00 00  
Fax +46 8 21 05 31  
registratorn@riksbank.se  
www.riksbank.se

## Do we need an e-krona?

*Do we need digital cash – an e-krona as the Riksbank calls it? This is a question currently being analysed and subjected to lively debate in the central bank world. It is scarcely surprising that there is so much interest in this question, given that it covers all of a central bank's areas of activity – the responsibility for a safe and efficient payment market, monetary policy and the task of maintaining financial stability. The question also touches on almost philosophical musings as to why the need for central banks arose once upon a time. What was then needed was a public institution that created a standard method of payment that the general public could rely on. Several centuries have passed since then, but the same need probably remains. This is why the Riksbank wants to investigate whether an e-krona could be the solution to provide the general public with continued access to central bank money even when Sweden has stopped using cash.*

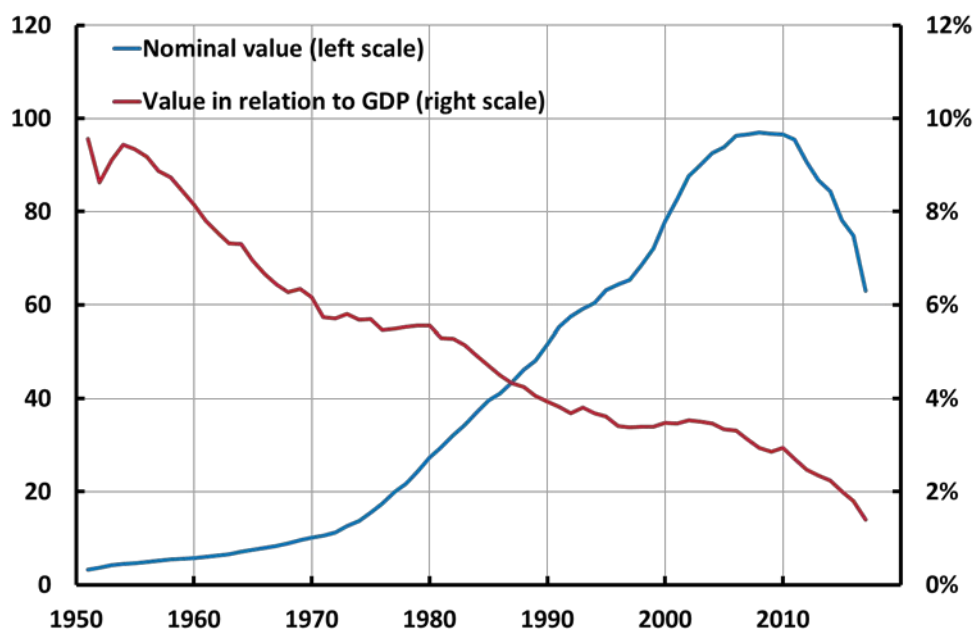
## Banknotes and coins abandoned

Various agents in society are approaching the subject of digital money from slightly different perspectives. In the central bank world, some have focused on the opportunities that technological innovations in the financial sector, particularly block chain technology, can offer the payment infrastructure. Others, particularly in emerging economies, regard digital central bank money as an opportunity to supply fundamental payment services to those people who do not yet have access to them.

In Sweden, we are approaching the issue from what is a unique situation in an international perspective, namely that demand for banknotes and coins is declining rapidly. Since 2008, the demand for cash has declined by around 40 per cent. This is largely due to the demand for the highest banknote denomination, the 1,000-krona note, having declined, which can be interpreted to mean that cash has lost its attraction as a store of value. In recent years, however, the demand for smaller

denominations, which are used in everyday transactions, has also declined.<sup>1</sup> But it is not only the decline in demand for cash that indicates the use of cash is diminishing. According to the Riksbank's survey of the Swedish people's payment habits, around 40 per cent of payments in the retail trade were made in cash in 2010. This figure has now declined to 15 per cent.

### Unique reduction in demand for cash



Note. SEK billion (annual average). Cash in circulation as a percentage of GDP. Sources: Statistics Sweden and the Riksbank.

It is a well-known fact that the payments market is characterised by network effects. Put simply, the more people who use or accept an instrument of payment, the greater benefit each consumer or merchant has from using or accepting it. Few people would want to have a card if there were not sufficient traders who accepted card payments. Traders on their part would not want to accept card payments if there were not enough consumers willing to pay with cards. In other words, a critical mass of users is needed for a payment instrument to be generally accepted and successful.

When fewer and fewer people are using a payment instrument, one gradually reaches a point where it is no longer profitable to continue using the instrument. Then it will disappear from the market, which was the case with cheques in Sweden in the 1990s. Given that the use of cash is declining rapidly, there is reason to wonder whether we are now reaching the same point with regard to cash. Ac-

<sup>1</sup> On 31 October 2017 there was SEK 45.2 billion in valid banknotes in circulation, with the 1,000-krona banknote accounting of SEK3.5 billion of this. The value of the valid coins was SEK 2.7 billion, including commemorative coins (SEK 34 million).

According to current research, half of Swedish traders believe they will stop accepting cash by 2025. In other words, for Sweden the cashless society is no longer just a hypothetical situation in the distant future.

## Digitalisation driving development

The rapid decline in the use of cash in Sweden is part of a broad digitalisation trend that affects society as a whole. Technological advances have given us, for instance, new more efficient payment solutions such as real-time payments with the Swish mobile application, which is used for transactions that used to be mostly cash-based. Similarly, mobile phones can function as card terminals, which gives small business owners increased opportunity to accept cards. Swedish banks also have a tradition of cooperating with one another when innovative payment solutions are introduced on the market. In this way, they can make better use of network effects and more quickly attain a critical mass of users. Moreover, Sweden has a highly-educated population that is willing to adopt innovations in the IT field. Technological advances that lead to more efficient payments, cooperation between producers of services who make it possible to fully utilise the network effects, changed consumption patterns and a technology-friendly population are a powerful combination when it comes to creating changes in payment habits!

In an international perspective, Sweden and the other Nordic countries are way ahead in this change process. However, the trend is global – an increasing number of people want to use digital solutions to pay and fewer want to use paper-based payments, including banknotes and coins. In particular, the younger generations are quick to adopt digital technology. It is probably therefore only a question of time before more countries find themselves in the same situation as we have in Sweden today.

## Is it a problem if cash disappears?

This is of course a valid question. There are some groups in society who for various reasons find it difficult to accept, use or gain access to digital technology and different solutions need to be found for these groups. But for the majority of the population, the market appears able to supply payment solutions on its own. The question does require some careful thought, however. What is money, and what is required for money to function as such? What is the difference between various types of money? Why have central banks gained such a central role in the monetary system? These are practical but nevertheless almost philosophical questions that cannot be fully dealt with in a short speech. But allow me to nevertheless develop these questions a little further.

## Can “new money” function as an arithmetical unit, store of value and means of payment?

It is difficult to define what money actually is. Put simply, one can say that it is an agreement or convention between individuals in a country or region that “something” will function as money. That “something” can be stones, shells, gold, pieces of paper or something else. What has been used as money has varied over time and between countries and cultures. But for money to function as such, it must be

able to guarantee three basic functions. Firstly, it shall function as (1) **an arithmetical unit**, that is, all prices shall be expressed in terms of this unit. This presupposes that there are not many different types of money in circulation that can give rise to different ways of expressing prices. There must quite simply be a standardised measure in the same way as the meter system for measuring distances. Secondly, money must be able to function as (2) **a store of value**, with a relatively stable value over time. This is needed because saving is a means of postponing consumption until a later date. Thirdly, it shall function as (3) **a means of payment**, that is, it shall transfer a value to the recipient, who can then use it to pay someone else. This requires that we have easy access to money when we need it and that the instruments we use as money can be comfortably transported with us. It is here that technological advances entail changes.

### The money we use must have the general public's confidence

There is a further element that is essential for money and the entire monetary system to function: the general public's confidence. All those who have entered into agreements entailing money should rely on them holding. The money must retain its value over time and be accepted by everyone.

Having said this, it is easy to understand why central banks were created once upon a time and were given the central role in the monetary system that they have now. The task of the central banks was to provide the general public with money in the form of banknotes and coins that did not entail any credit risk and that inspired confidence – what was known as central bank money. This task included price stability, that is, that the central banks guaranteed the long-term value of the money. To begin with, the central banks had this task parallel to commercial banks, which issued their own banknotes. Then money from different issuers could have different values, depending on how much money had been issued, and exchange rates could arise between different types of money. Eventually, the central banks were also given the responsibility for creating a uniform standard. In Sweden, this took place in 1904, when the Riksbank was given a monopoly on issuing banknotes and commercial banks stopped issuing them.

In time, the banks were able to develop payment channels that enabled the general public to use their account balances as money. In the beginning this involved cheques and gradually card payments were developed. In Sweden, there were also state initiatives to make payments more effective. In the 1920s, the Postgirot system was created, which enable efficient transfers of money to and from accounts in the system. Just over 20 years later, the banks emulated this and created their own joint system, Bankgirot. All of these systems are examples of account-based means of payment. They meet all of the functions that money shall have: they make use of the same arithmetical unit, their value is guaranteed by the Riksbank's monetary policy mandate and, as technological advances continues, these account-based systems offer increasingly efficient mediation of payments. Account-based means of payment have since come to replace payments with banknotes and coins to an increasing extent right up to the current situation. Nowadays, some account-based payments can also be made in real time, a property that only cash payments could boast once upon a time, when the payment was made after banknotes changed owners.

## Without cash, the general public loses access to central bank money

If cash were to disappear completely, the general public would only have access to account-based private bank money. The banks, on the other hand, continue to have access to central bank money as they have accounts in the Riksbank. So is this a problem? We return here to the central element of the monetary system mentioned earlier – confidence in the system. During normal times this is not a problem. The banks can normally offer a sufficiently high interest rate to attract investors. But in times of financial stress, which unfortunately occur with some regularity, both banks and the general public want access to the central bank's money, which is free from credit risk. The deposit guarantee alleviates the problem of a lack of confidence but does not entirely resolve it.

It is scarcely surprising that a central bank in the Riksbank's situation needs to at least *investigate* whether the arguments that have historically been so important – that the central bank shall provide the general public with assets and means of payment free of credit risk – no longer have such great significance. Is it the case that the general public no longer wants central bank money? Or is it rather the case that it is only money made of pieces of paper (or cotton) that they no longer wish to hold in an increasingly digitalised world? If it is the latter, then it is the Riksbank's duty to investigate the scope for issuing a digital alternative – an e-krona that the general public can hold. The questions that led to the Riksbank's monopoly on issuing banknotes in 1904 arise again.

## But there are also other reasons for investigating a digital alternative

Payment in cash presuppose a chain of action that involves issuing, transporting, storage and distribution of banknotes and coins. It requires a relatively expensive physical infrastructure to make it work. However, the actual transactions in cash do not require any further infrastructure. Once the banknotes have changed owner, the payment is complete.

Payments that are based on individuals having accounts in the bank, what are now electronic payments, on the other hand require a centralised infrastructure and processes to identify counterparts, to verify account numbers and to check whether there are sufficient funds in the accounts. This infrastructure is often housed with the supplier of the payment service or with some other intermediary. After these checks, the actual payment is implemented, that is, the money is moved from the payer to the recipient. This is called clearing and settlement and it requires a further infrastructure. The systems that manage the entire process are characterised by both network effects and economies of scale. Both aspects mean that the payment infrastructure must of necessity be very concentrated and standardised. Although this is necessary, it entails a number of other problems.

One such problem is greater vulnerability in society as a result of what is usually called the “single point of failure”. If the infrastructure is affected by serious shocks, there are no alternatives available, especially if cash has been phased out. Let us assume that the card system stops functioning for some reason, at the

same time as cash payments are no longer possible in practice. This situation would cause serious disruptions to society.

A further aspect to take into account is that when the infrastructure is concentrated to the hands of a few, it is easy that problems arise with regard to lack of competition and entry barriers for new agents. Ultimately, this can in turn entail efficiency losses for society as a whole and low incentives for innovation.

A potential e-krona could alleviate both of these problems. An e-krona could be based on a separate infrastructure that could be used if the alternative systems fail. The infrastructure that an e-krona would require could also be open to private agents willing to offer payment services linked to the e-krona. The Riksbank would cooperate with the market, both payment suppliers and fintech companies, when offering an e-krona to the general public. In this way, an e-krona system could also provide a platform that promotes competition and innovation.

## E-krona is a possibility

Almost three months ago, the Riksbank published a first interim report which contains much of what I have talked about today. There is also a general description of how an e-krona might look. It should be available to all, banks, public authorities, companies and households. It should be possible to use it in real time, 24 hours a day and 365 days a year. It should be possible to use off-line, which means it could be used even where there is no access to a mobile network, for instance. Perhaps it could contain some element of anonymity, and perhaps it could be designed so that even groups who currently find digitalisation difficult to handle can easily use the e-krona. These are our initial thoughts and the reason why we published the report before we have thought it all through is that we want to have a dialogue with the market and other interested parties, as it is such a complex issue. The dialogues have now been initiated.

We have already identified a number of questions that require further analysis. These are questions regarding technology, legal issues and the effects of the e-krona on the economy and financial agents.<sup>2</sup> The Executive Board of the Riksbank will soon take a stance on how to continue the work on these questions next year. We will continue to be as open as possible and I would like to emphasise that what we are doing is examining the possibility of introducing an e-krona. No decisions have yet been taken.

I would like to conclude my speech by reminding you that it was in Stockholm that the first modern banknote was created more than 350 years ago, and that it is here, in Sweden, that cash is currently taking its last breaths. Perhaps the Riksbank will be writing history again.

---

<sup>2</sup> See, for instance, James Tobin (1987), "The Case for Preserving Regulatory Distinctions", *Challenge*, vol. 30, No. 5, pp. 10-17. There are also clear points of contact with the investigation that preceded the creation of Postgirot (Statement and proposal regarding the introduction of a postal cheque business. Sthm 1919. Marcus. 4:0)