

## Payments in Sweden 2019



The report Payments in Sweden describes and analyses developments on the retail payment market and the services offered by the Riksbank. It is published once a year, starting 2019. The report summarises developments over the past year and presents the Riksbank's assessments and policy in the area. The aim is for the report to contribute to a knowledge-based debate and make it easier for external parties to monitor, understand and evaluate the Riksbank's policy on the retail payment market.

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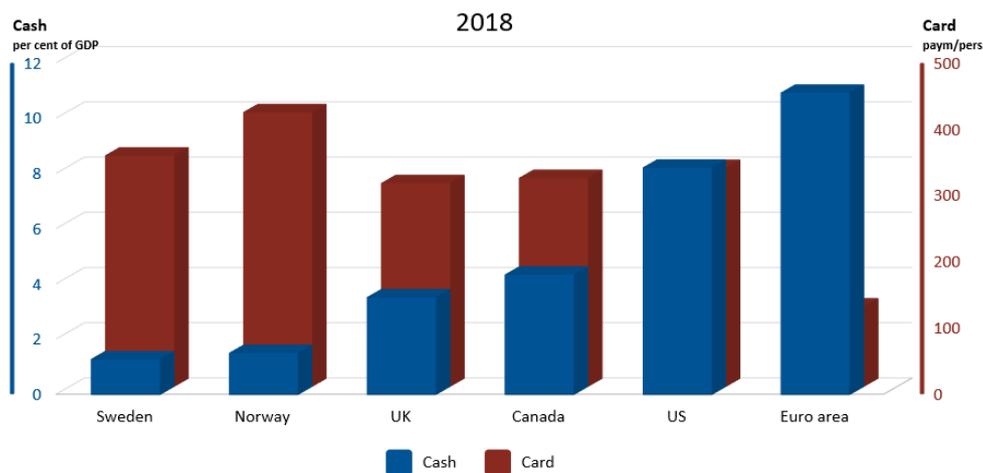
This report is adapted for reading online at [riksbank.se/payments-in-sweden-2019](https://riksbank.se/payments-in-sweden-2019)

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## Payments in Sweden 2019

*The Swedish payment market is changing rapidly. Digital payment methods are forcing out cash and new technology is leading to payment services being offered by companies other than banks. This is happening fast in Sweden. Digitalisation makes payments easier and smoother, but also creates risks that need to be managed. The Riksbank therefore needs to keep up with developments and modernise both its money and its systems.*



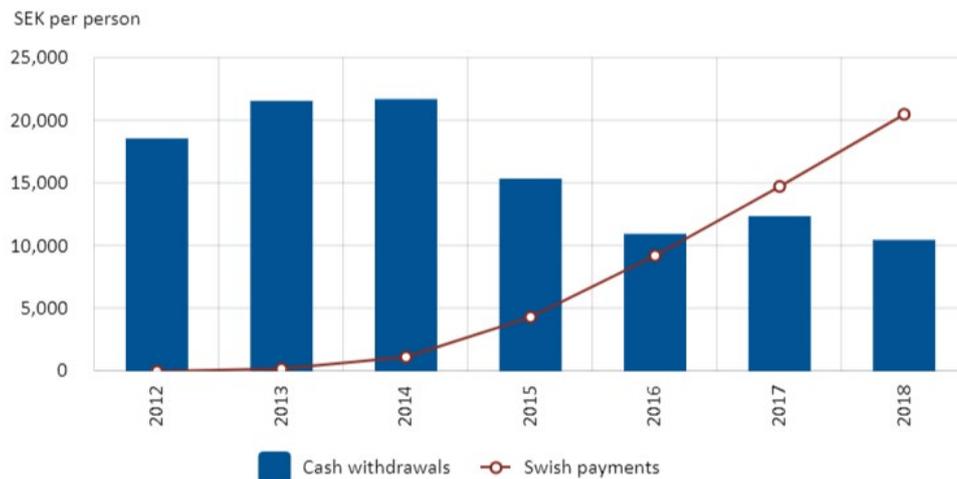
### The digitalisation of the payment market is progressing at a rapid pace in Sweden

*The figure illustrates that the use of card payments (the red bars) is growing in all countries while developments in cash are more mixed (the blue bars). The red bars show the number of yearly card payments on average per person and the blue bars show the value of cash in circulation in relation to GDP. The amount of cash in circulation provides a rough measure of the demand for cash in the economy. Note figures for US card payments 2018 are missing and thus set equal to 2017.*

Sources: The Riksbank, BIS, ECB and Norges Bank

## The payment market is being digitalised

*The payment market is going through a phase of major change driven by new digital technology. It has become easier for most people to pay as it is now possible to pay by card or mobile phone virtually everywhere. Paying by card is most common, although payments by mobile phone (Swish) are increasing sharply and several shops now also accept invoice payments. At the same time, the use of cash is declining. Paying may therefore become more difficult for certain groups that are unable to use digital technology.*



### Payments by mobile phone (Swish) are increasing sharply and the use of cash is declining

*The figure shows that the value (SEK per person and year) of cash withdrawn from ATMs has fallen in recent years while the value of Swish payments has risen sharply.*

Sources: Bankgirot and the Riksbank

## Key drivers and trends

*The digitalisation of society opens the door for new payment solutions and new players on the payment market. New legislation (PSD2) and new technology are accelerating this development. It is becoming easier to pay for most people and consumers have more options than cards and cash.*

### Broadband and mobile phones enable new solutions

Via the internet, smartphones and other information technology (IT), digitalisation has changed our way of working, communicating and shopping. The payment market and the way we pay are also undergoing major change to meet the new needs. This trend has been going on for some time, but in recent years has been

given extra impetus from the expansion of mobile broadband and the proliferation of smartphones.

Mobile broadband is now available in all densely populated areas and in most rural areas in Sweden, while 90 per cent of the population over the age of twelve now have a smartphone. Mobile broadband and the proliferation of smartphones have opened the door for payment solutions that make it easier to pay electronically in many places where it was not previously possible. However, there are still areas with poorer coverage and payment apps that cannot be installed on older smartphones. Special attachments that turn a mobile phone into a card reader have been available for a number of years. This has made card readers cheaper and means that they no longer require a specific physical location. As a result, new categories of traders, for example market traders or private individuals, can now receive card payments through their mobile phone. Another payment solution that enables electronic payments in new places and in new contexts is the bank-owned payment app Swish. Swish makes it possible to make instant account-to-account transfers from a mobile phone without using a payment card or logging on to an online bank. The company has also launched new services for payments in shops and for eCommerce in recent years.

### **Technical innovation and new players**

Large tech-companies abroad are experimenting with new services, for example automatic registration of customers when a product is taken from a shelf in a shop. Payment then takes place automatically when the customer leaves the shop. In addition, payments for remote purchases can also be simplified and automated, for example, by using technology for “smart” contracts. Smart contracts are small-scale software that performs an action based on what has happened beforehand, so that, for example, payment is only made once a product has been delivered.

Payments by card in shops have become easier as a result of contactless technology, also known as Near Field Communication (NFC). Debit and credit cards equipped with NFC only need to touch the card reader. Combined with smaller purchases not requiring the input of a PIN code, this is making card payments faster and smoother. Virtually all new payment cards are equipped with contactless technology. The goal for market players is for all cards and 94 per cent of readers to be equipped with NFC by the end of 2019. The technology can also be used to pay by mobile phone in shops, although such payment solutions are relatively new and so far only used to a small extent in Sweden.

Another trend affecting how we pay is the emergence of new companies that simplify the payment process when we shop online. For example, solutions are

offered whereby you can pay via your online bank or by invoice and no longer give your card details when making the purchase. It is often possible for those wishing to pay by card to register their card details enabling purchases to be made at the touch of a button.

A longer-term trend in some other countries is the entrance of large IT companies, such as Google, Apple and Facebook, into the payment market. This type of company already has large, well-established networks of customers, often on social media platforms, which can give them a competitive edge. There may also be a strong link between social media and the possibility of being able to pay friends within the network, which may lead to very rapid growth in IT company payment apps. This has happened in countries such as China with the Wechat and Alipay apps. Other examples include Apple Pay, Google Pay and Samsung Pay. In June, Facebook announced that it has plans to launch its own cryptocurrency called Libra in cooperation with a number of other companies. The intention is to link the cryptocurrency to a basket of currencies such as the dollar, euro and yen to guarantee that Libra has a stable value. This means that Facebook and other companies would supply payment services that do not use Swedish kronor (SEK), which could have consequences for Sweden if Libra becomes popular. It is already possible in certain countries to have a payment card that is linked to a cryptocurrency. When the card is used, the cryptocurrency is exchanged for the relevant national currency and the payment is made through the traditional card system.

Many new payment services are based on older technology and solutions that have been used for payments for several years. For example, mobile wallets such as Apple Pay are based on card payments. The user enter their card details into the app once and then their payment card is used automatically by the mobile app. The fact that consumers have more payment options does not therefore necessarily mean that the payment system has acquired greater redundancy and robustness. Swish is an exception, as it is based on an entirely separate solution.

### **PSD2 enables greater competition**

The EU has been working to increase competition on the payment market. A modified regulatory framework gives payment service providers the opportunity to access customers' payment accounts and thereby initiate payments and compile account information. The second payment services directive (PSD2) has been fully implemented since September of this year. It opens the door for innovations that can make it easier and cheaper to pay. For example, an account transfer can be initiated directly from an e-trader's website (direct payment). These new payment services compete with traditional payment services, such as

cards, and give consumers and companies more options. This should lead to cheaper and smoother payment services, which is also one of the objectives of PSD2. The directive also contains provisions to make electronic payments safer.

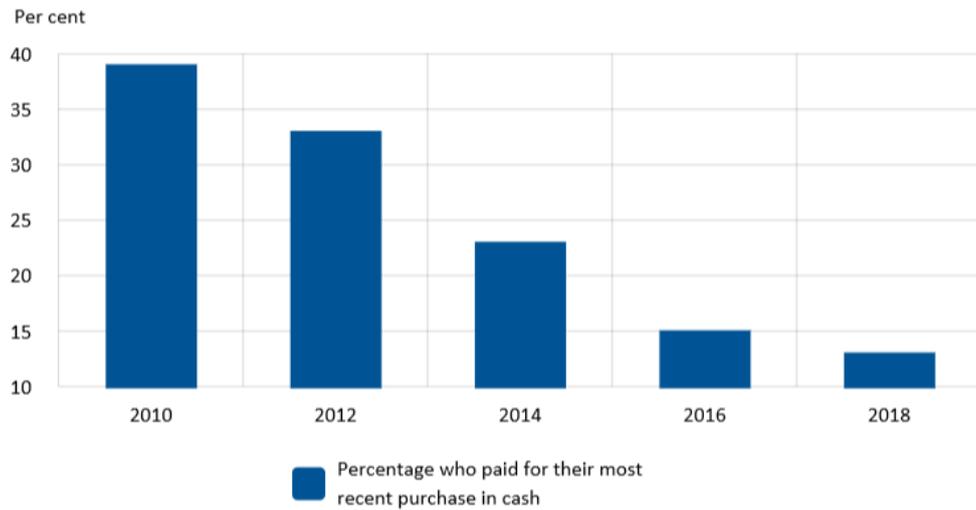
### **The Riksbank adapts its systems**

Most payments in Sweden are currently settled in the Riksbank's settlement system for large-value payments (RIX). As RIX is constructed for large-value payments between financial institutions, all smaller payments between bank customers have to be compiled into large payments (clearing) before they can be settled in RIX. This process takes time, and also requires coordination and intermediaries. This will change if the Riksbank eventually uses the Eurosystem's and ECB's platform for instant settlements, Target Instant Payment Settlement (TIPS). TIPS allows for each payment to be separately and instantly settled around the clock. This reduces the need for intermediaries and opens the door for new innovative payment solutions.

Overall, it is reasonable to expect cheaper and smoother payment solutions in the future. But this development also raises a number of questions about competition. For example, it may become difficult for a user to change payment service provider if the service is so smooth that the user does not even know which company is behind it. There are also questions with regard to privacy protection and to the safety and robustness of the payment system. It may also become more difficult to promote safety on the payment market if much of the infrastructure is located abroad and run by players with their headquarters in another country.

### **Cash use in constant decline**

*Swedes pay less and less frequently in cash and more and more shops and restaurants are no longer accepting it. The trend in Sweden differs from that in other countries. It means that some groups are finding it increasingly difficult to pay.*



### Cash is used to a lesser extent

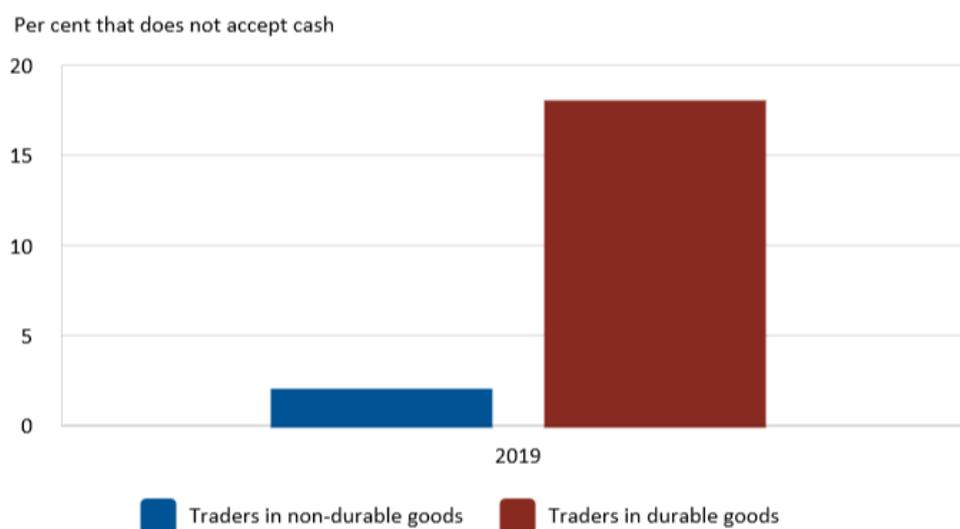
*The figure shows that the proportion of those who paid for their most recent purchase in cash has decreased from 39 per cent in 2010 to 13 per cent in 2018. (As from the beginning of 2018, the question refers only to purchases in physical shops).*

Source: The Riksbank

## Why are we no longer using cash?

More and more Swedes no longer use cash. In 2010, 39 per cent of the respondents in the Riksbank's survey on payment habits in Sweden said that they paid for their most recent purchase in cash. In 2018, this figure had fallen to 13 per cent. At the same time, almost 40 per cent said that they had not used cash in the last month.

Some shops, restaurants, cafés and other companies in the services industry have stopped accepting cash. For example, almost 20 per cent of shops in the durable goods segment now no longer accept cash, according to the Swedish Trade Federation. In the non-durable goods segment, almost all traders, 98 per cent, still accept cash.



### Traders in non-durable goods accept cash more often than traders in durable goods

*The figure shows that two per cent of traders in non-durable goods did not accept cash in April 2019. At the same time, 18 per cent of traders in durable goods did not accept cash.*

Source: Swedish Trade Federation

The decline in cash use is in part due to our changing purchasing habits and our use of new payment services. Swedes shop more frequently online where it is not possible to pay in cash. At the same time, new technology and new payment services are also making it easier to pay electronically in physical shops and in the services industry.

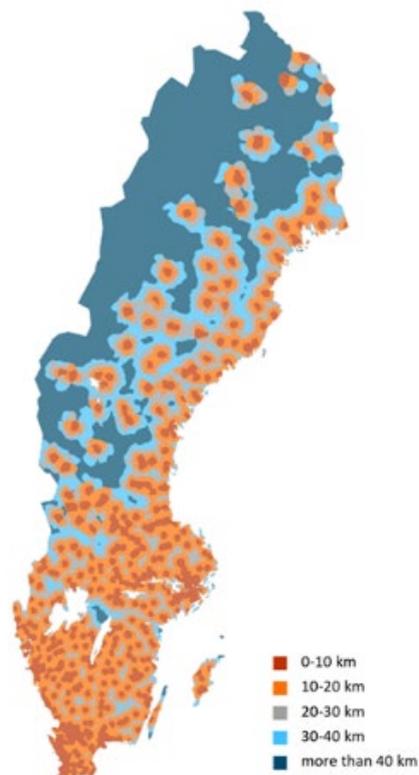
The declining cash use is making it expensive for the private market to provide cash to the whole country, and could affect the flows of cash. In some places where market players no longer offer services for cash withdrawal and the depositing of daily takings, the state, via the Swedish Post and Telecom Authority and the county administrative boards, is providing economic support to “payment service agents”. There are currently 38 payment service agents who have support from the county administrative boards, an increase since 2014, when there were 20 of them. Most counties in Sweden have one or more payment service agents.

### Some find it difficult to pay

For some groups, primarily those who cannot or do not wish to use digital payment services, it can be difficult to pay in certain situations. The county administrative boards are tasked with ensuring that the possibility of withdrawing cash, paying bills and depositing daily takings corresponds to the needs of society. According to them, it is mainly elderly, new arrivals and people with certain disabilities that have poorer access to such fundamental payment services. It is

important for these people to receive personal help, but it is becoming increasingly difficult for them to access it when more and more service points that have offered personal service are closing down. Furthermore, the geographical distance to bank branches, or other payment service mediators, is considerable in some parts of the country.

Certain companies in the tourism sector and associations can sometimes have difficulty receiving payments. Some foreign cards are not accepted by all payment terminals and the wireless technology for payments is not always reliable in rural areas. For example, associations report that they may have difficulty depositing their daily takings, which makes it more difficult for them to receive cash as payment. New technology, for example Swish, has facilitated the situation but the fees are seen as high.



**Distances to payment mediators can be considerable in northern Sweden**

*The figure shows that the distance to bank branches or other payment service mediators is considerable in more sparsely populated areas north of Dalarna and Gävleborg. The distance to payment mediation services is significantly shorter in southern Sweden.*

Source: Pipos, Swedish Agency for Economic and Regional Growth.

## Do we have the right to pay in cash?

Under the Sveriges Riksbank Act, cash is legal tender in Sweden, which means that it is to be accepted as payment everywhere. But the rule can be waived by agreement by shops, restaurants, etc., via what is known as *freedom of contract*. In other words, a shop can basically refuse to accept any cash at all, refuse to accept coins or certain denominations (for example 1000-krona banknotes). From a consumer perspective, it is helpful to obtain this information in advance (for example in the form of a sign on the shop door) so that they can choose if they wish to shop there or go somewhere else. However, hospital care is an exception. According to a judgement in the Supreme Administrative Court from 2015, the county council must offer patients the option of paying in cash.

## Do we have the right to demand cash services at banks?

Freedom of contract also applies in principle to banks in relation to their customers. Here, too, the agreement can be written or verbal. It is therefore not necessarily a question of an actual written contract; it is sufficient for the bank to simply inform customers that it does not accept cash.

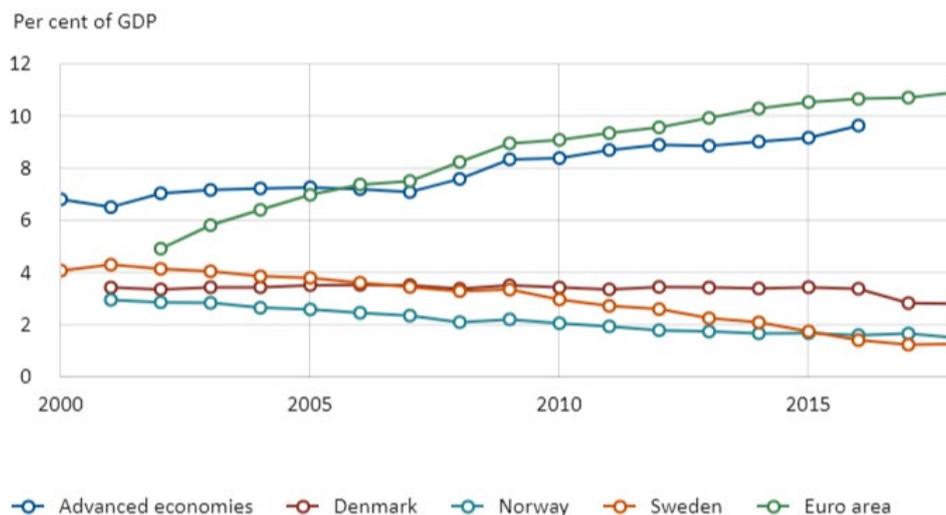
In the government bill Obligation for certain credit institutions to provide cash services from 26 September 2019, the government proposes legislative amendments to secure access to cash and payment services. Banks with operations in Sweden and with deposits of over SEK 70 billion, shall be given a special responsibility to ensure that there are functional cash services throughout the country. Under the proposal, Swedish banks or branches of foreign banks that supply payment accounts to consumers and companies shall provide locations for cash withdrawals and daily takings deposits to an adequate extent throughout the country. In regulations, the government shall specify what this obligation involves. If a bank does not fulfil its obligations, the Swedish Financial Supervisory Authority, Finansinspektionen, may intervene by issuing a rectification order or financial penalty. The government proposes that the amendments shall enter into force on 1 January 2021.

## Developments in Sweden differ from those in other countries

The amount of cash in circulation in Sweden has halved since 2007. This trend is unique to Sweden, even though Norway is also on a low level. In contrast, cash volumes are increasing in most other countries. A simple way of comparing cash volumes in different countries is to set them in relation to the size of the economy (gross domestic product, GDP). In Sweden and Norway, the ratio of cash to GDP has been falling and is now significantly lower than in other countries. Since January 2018, the volume of cash has increased slightly in Sweden, which is

probably largely due to households starting to withdraw cash again after the completion of the banknote and coin changeover. Over time, we see that the volume of banknotes and coins circulating in society is declining.

In many other countries, however, cash volumes in relation to GDP have risen since the financial crisis of 2008-2009, as the demand for cash is increasingly more rapidly than the economic growth rate. This may have to do with a desire to move some savings from the banking system in times when it is perceived to be uncertain. In certain cases, it may be a question of savings or of people using cash outside the country that issues the currency. Some currencies, such as the dollar and the euro, are often considered as safe investments around the world. In other words, the fact that cash volumes in these currencies are increasing more rapidly than the countries' GDP may have many different causes.



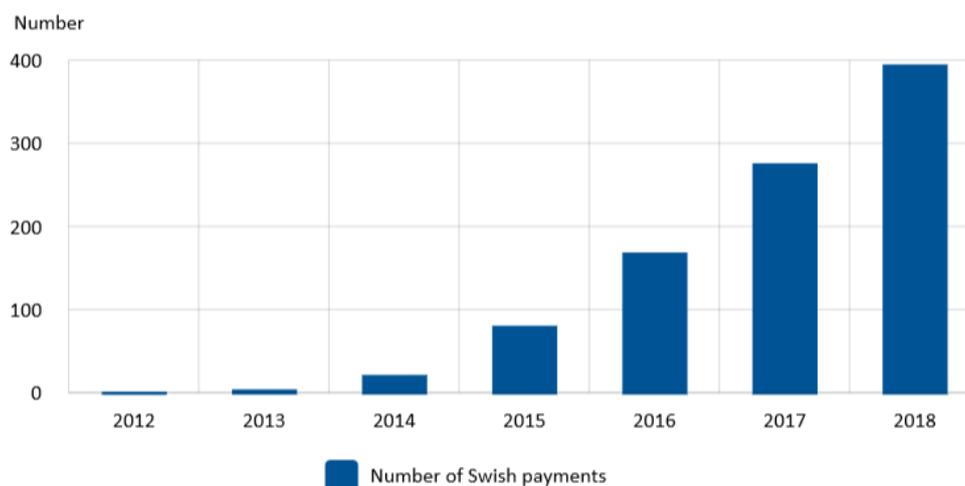
**In Norway and Sweden, cash volumes are falling. In other countries, they are growing**

*The figure shows that the ratio of cash to GDP has shown a falling trend and is very low in Sweden and Norway, where it corresponds to one per cent of GDP. The cash ratio is significantly higher in other countries. In the euro area, for example, it amounts to almost 10 per cent of GDP.*

Sources: BIS and ECB

## More common to pay by mobile phone app (Swish)

*Payments in the form of instant account-to-account transfers are increasing sharply. For this type of payment to be able to continue to grow, the infrastructure for payments needs to be modernised. Swish is the most common form of instant payment in Sweden.*



### Number of payments by Swish increasing sharply

*The figure shows that the number of Swish payments (millions of payments per year) made by mobile phone (in real time) has increased from 0 in 2012 to 400 million in 2018.*

Source: Bankgirot

## Seven out of ten Swedes use Swish

The Swish payment app was launched at the end of 2012. It enables people to make instant, real-time payments from their payment account to other payment accounts. Since 2012, the number of payments made via the app has increased sharply. In 2018, Swish was responsible for six per cent of all electronic payments in Sweden.

Swish payments can currently be made immediately 24 hours a day, 365 days a year, thanks to a settlement platform (Betalingar i realtid, BiR) that is jointly owned by banks. BiR is a private service and settlement is carried out in private bank money via the banks' BiR accounts. Banks also deposit money in accounts at the Riksbank which works as a kind of guarantee for the payments made via BiR. We can therefore say that settlement in BiR takes place in private bank money backed by central bank money. In partnership with the banks, the Riksbank has developed this solution and by doing so laid the foundation for a settlement solution that minimises credit risk between participants in BiR. In the long term, a possible alternative to BiR is to settle Swish payments in central bank money on the TIPS platform.

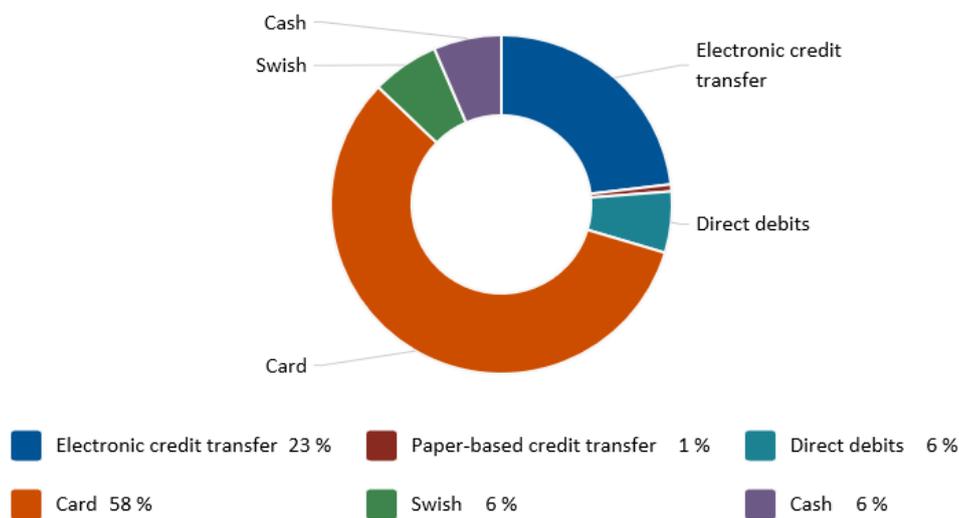
The number of Swish payments will probably continue to grow. Until now, the growth has primarily been in person-to-person payments. But more and more companies and associations are starting to accept Swish payments. The company that runs Swish (Getswish AB) has launched new services that have expanded the area of use for the payment service from person-to-person payments to

eCommerce and payments in shops. Looking forward, it is highly likely that instant payments will also be able to be initiated in other ways than with the Swish app, for example via online or mobile banking.

Instant payments are set to become increasingly common on the Swedish market and not just between private individuals or from consumer to company but also between companies and authorities. This means that it will become increasingly important to ensure that the settlement infrastructure for instant payments is efficient and can manage financial and technology-related risks. The Riksbank has made the assessment that the best solution is to use the ECB and Eurosystem platform (TIPS) to settle instant payments in SEK. This will promote efficiency as it will utilise the economies of scale inherent in a larger system while at the same time offering a competitively neutral settlement platform. Risks are simultaneously mitigated as the settlement of payments is carried out in central bank money.

## Card payments still dominate

*The majority of household purchases in Sweden are made by card. In ten years, the average Swede has doubled their card use. However, large-scale payments often take place between companies and authorities and are done via credit transfers.*



### Most payments in Sweden are card payments

*The figure shows that almost 60 per cent of payments in Sweden are card payments. The number of cash payments is estimated based on data on the number of cash withdrawals, etc.*

Source: The Riksbank

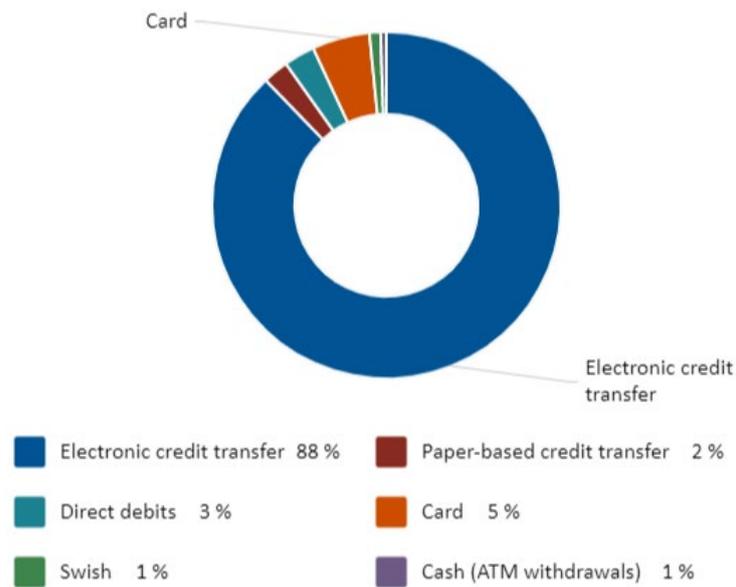
## **Most payments are card payments**

In terms of number of payments, card payments are totally dominant in Sweden. In total, about six billion payments were made in 2018, which is the equivalent of two payments per person per day. In most cases, payments were made by card, about 60 per cent of the total (estimate), while Swish, credit transfers and direct debit together made up just over 35 per cent (estimate). The Riksbank estimate is that the number of cash payments constitute just above 5 per cent of the total number of payments.

Sweden is one of the countries with the highest card use in the world. In ten years, the average Swedish consumer has doubled their card use, from about one payment every other day in 2008 (176 per person per year), to 349 payments in 2018, which is almost one per day.

## **Large payments take place via transfers**

The picture is different if we instead look at the value of payments. In Sweden, total payments at an estimated value of almost four times the country's GDP were made in 2018. Credit transfers make up almost all this value. It is mainly a question of payments between companies or between authorities and companies. Card payments only amount to about five per cent of the total value, while cash payments are estimated to be around one per cent.



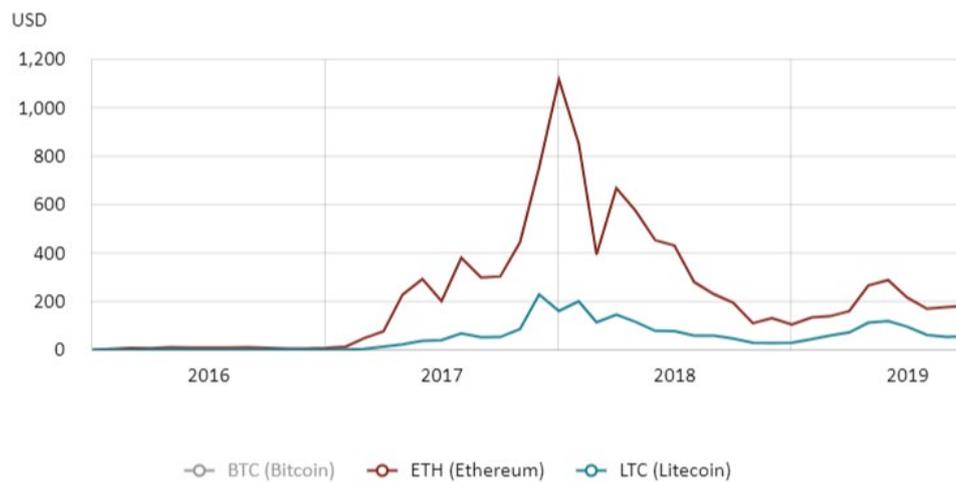
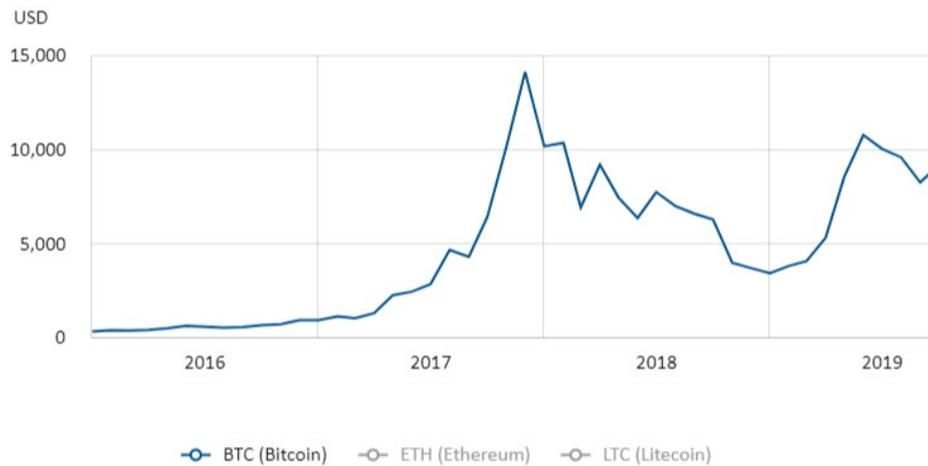
### Most money is transferred via credit transfers

*The figure shows that, in terms of value, credit transfers make up more than 90 per cent of payments in Sweden.*

Source: The Riksbank

## Cryptocurrencies are not normal money

*Cryptocurrencies, such as Bitcoin, vary considerably in value and are difficult to use to make payments. "Stablecoins" are a new kind of cryptocurrency that aims to be more stable, for example, by having reserves in other currencies or assets. Facebook's announced cryptocurrency Libra is an example. New types of cryptocurrency may affect the payment market and the financial system.*



### The value of Bitcoin and many cryptocurrencies varies considerably

The figure shows how the price in US dollars (monthly average) of Bitcoin, Ethereum and Litecoin has varied sharply over time. Bitcoin's highest value was almost USD 19,500 (December 2017) but its current value is down at around USD 9,200 (October 2019).

Source: Macrobond

## First-generation cryptocurrencies does not work well as money

Cryptocurrencies have received a considerable amount of attention in recent years. The most well-known example is Bitcoin. Bitcoin advocates say that it can work as money and is particularly attractive for those who wish to make international payments. But the price of Bitcoin and similar cryptocurrencies has varied considerably over time, while it can also be expensive to use them for payments. In addition, the payment is not carried out instantly. Therefore, it is difficult to believe that most of those who have acquired Bitcoin have done so in

order to manage their payments. It is more likely that most owners of cryptocurrencies have bought them as a speculative asset that they hope will rise in value. In other words, this type of instrument does not work in practice as money and the Riksbank, like other central banks, therefore considers cryptoasset to be a more suitable term than cryptocurrency. The use of cryptoassets for payments is extremely marginal in Sweden.

Cryptoassets are often associated with the special technology upon which Bitcoin is built, known as “blockchain” technology. The idea of blockchains is to build up a decentralised system of information that is safeguarded against counterfeiting by means of advanced encryption. This in turn means that no central node is needed in the system that guarantees authenticity. Not all cryptocurrencies use blockchain technology, and blockchain technology can in turn be used for many different things.

### **Second-generation cryptocurrencies may work better**

“Stablecoins” are cryptoassets that are constructed in order to maintain a more stable value. There are two main types. The first type is “algorithm-based” stablecoins, the value of which is kept stable by adapting the volume of stablecoins issued to the demand for them, with the help of rules and routines (algorithms). This type is less common. The second type is based on each issued stablecoin being in some way backed by assets such as securities, commodities or bank assets in, for example, dollars or euros. Central banks are currently discussing whether to open the way for stablecoins backed to a hundred per cent by central bank reserves. There are also variants of stablecoins backed by other cryptoassets.

Stablecoins where the backing fulfils specific legal requirements can be approved as “e-money”. Their price can then be expressed in national currency and used for payments. An example is Monerium, which has a licence to issue Icelandic króna on a blockchain. It remains to be seen whether such stablecoins become widespread and hence start to affect the payment market and how we pay.

In June 2019, a consortium of companies active in finance, IT and social media, the Libra Association, announced its intention to launch a new stablecoin called Libra. Libra differs from other stablecoins as the proposal comes from companies that already have global reach. It is therefore possible that Libra could quickly achieve the network effects and economies of scale necessary for a means of payment to successfully be able to establish itself. Even though Libra is still in the developmental stage and has a long way to go before it can constitute a practical alternative, it still poses a challenge to traditional forms of money and payment systems. There are a number of question-marks around how Libra is intended to

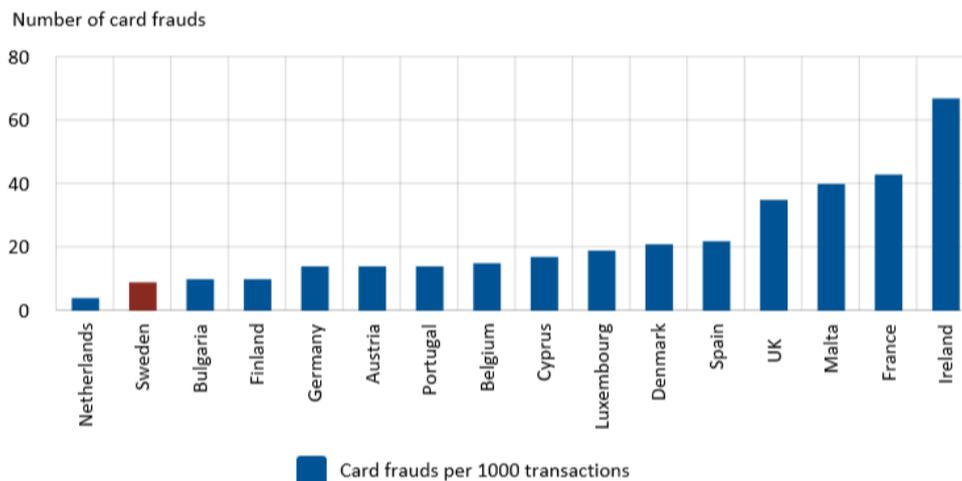
work; its forms of governance are still unclear, for example. It is also unclear how it shall fulfil applicable regulatory frameworks regarding anti-money laundering, counter-terrorism financing and consumer protection. Authorities in several countries and international organisations such as BIS and the G7 are examining whether Libra can be allowed to start. The Riksbank is closely monitoring the development of Libra.

## Swedish payments are secure and efficient

*Even if digital payments are simple and convenient, the development places new demands on security. The number of frauds with stolen card details or identities has increased, for example. Crimes linked to cash, such as bank or cash-in-transit robberies, have simultaneously decreased sharply. Digitalisation has also led to falling costs for payments in society. From an international perspective, payments in Sweden are both secure and efficient.*

## Security in Sweden is high from an international perspective

*When cash is used less and less, the number of crimes linked to cash also falls. However, at the same time, the number of frauds in which somebody uses somebody else's card or identity is increasing. The number of frauds is low from a European perspective.*



### Card frauds in Sweden are few from a European perspective

*The figure shows that the number of card frauds per thousand cards is also relatively low in Sweden, in comparison with many other countries in Europe.*

Source: ECB

## Money and the institutions handling payments must be secure

Several things are needed for payments to be secure. Firstly, money must maintain its value over time. Secondly, the institutions that handle our money and payments must be secure. Thirdly, the financial infrastructure, which is to say the technical systems used to mediate payments between different credit institutions, for example banks, must be secure.

The Riksbank's inflation target ensures that a Swedish krona keeps its value over time. Finansinspektionen, the Riksbank and other authorities work to ensure that the credit institutions and the infrastructure handling our money and payments are secure. The deposit guarantee means that private individuals with money in institutions covered by the deposit guarantee receive compensation from the state (up to SEK 950,000 per institution) if the institution enters bankruptcy or if the Swedish Financial Supervisory Authority, Finansinspektionen, decides that the deposit guarantee is to be applied. All Swedish banks are covered by the deposit guarantee.

The Riksbank's assessments of the risks in the banks and the financial infrastructure in Sweden are presented in the Riksbank's report on financial stability twice per year. In the latest report, the Riksbank's assessment was that the financial infrastructure works well overall at present, but that resilience to financial and operational risks needs to increase.

The Riksbank's central settlement system for large-scale payments, RIX, and the clearing house, Bankgirot, are central hubs in the Swedish payment system. Disruptions and interruptions in either of these systems therefore affect the entire payment system and can result in one or more payment systems ceasing to function. In recent years, the disruptions that have occurred in RIX have not affected the ability of companies and households to make payments.

The Swish service has experienced few disruptions in 2019, but customers may still have had problems using the app to pay. The disruptions may have their origin in Swish, the underlying infrastructure (BiR) that Swish utilises, or one of the participating banks. As a customer, it is difficult to know where the cause of the disruptions lies. Of course, as more and more people use Swish and rely on the service, it becomes more serious when there are disruptions in the underlying infrastructure. It is therefore important for the institutions and infrastructure that enable Swish payments to ensure vulnerabilities are minimized.

## **The actual payment must be secure**

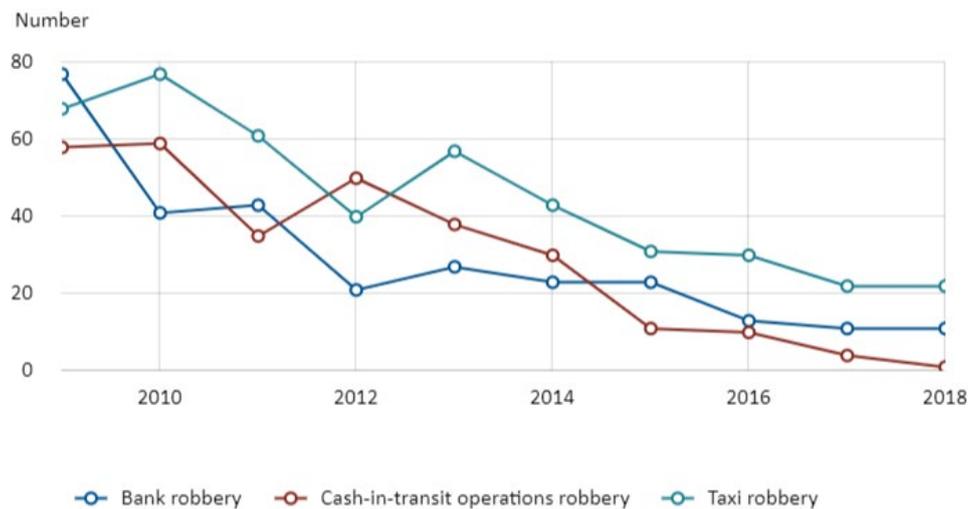
Even if the money and institutions that manage our payments are secure, there may be other risks linked to our payments and means of payment.

For example, cash is at risk of being counterfeited or stolen. As regards counterfeiting, the new Swedish banknotes have a very high level of security and are difficult to counterfeit. In 2018, a total of 453 counterfeit banknotes were discovered in Sweden, which is a decrease of about 16 per cent from 2016, when 537 were discovered. A common way of comparing the number of counterfeit banknotes across different countries is to specify how many counterfeit

banknotes were found in circulation in one year in relation to how many million banknotes are in circulation in each country. Sweden and the Scandinavian countries have a rate of two to three counterfeit banknotes per million banknotes in circulation, and this figure has not changed in a long time. In an international perspective, these are very low figures. Small currencies, like the Scandinavian ones, usually have few counterfeits in comparison with the larger economies, such as the United States, the euro area and China.

## Crimes linked to cash have fallen

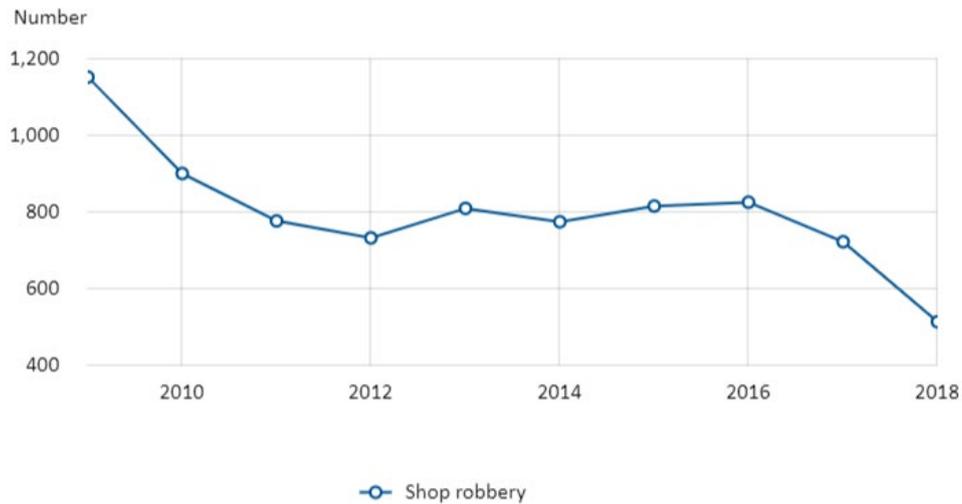
As cash usage has fallen, the number of robberies aimed at stealing cash reported to the police has fallen sharply. This applies equally to bank robberies and to robberies of shops and cash-in-transit operations. Much of the reduction can probably be explained by there now being less cash in banks and shops. For example, Sweden had no cash-in-transport robberies last year. However, the number of robberies aimed at private individuals reported to the police has remained stable at around 6,500 per year. These are aggregated statistics and do not differentiate between robberies for cash and for other objects.



### Sharp decrease in robberies of banks, cash-in-transit operations and taxis reported to the police in Sweden

*The figure shows that the number of robberies of banks, cash-in-transit operations and taxis reported to the police has decreased sharply over the last 10 years.*

Source: Swedish National Council for Crime Prevention



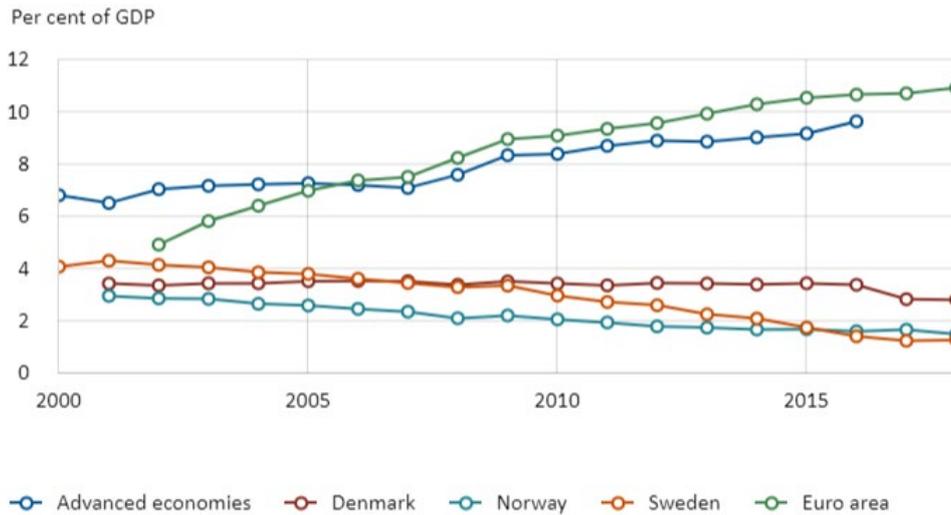
**The number of robberies of shops reported to the police has decreased as cash is used less frequently**

*The figure shows that the number of robberies of shops reported to the police has more than halved since 2009.*

Source: Swedish National Council for Crime Prevention

## Electronic payments create new risks

An electronic payment means, among other things, that sensitive information needs to be exchanged by the payee, for instance the card number and CCV code. If external parties gain access to sensitive information, this may sometimes be used to commit fraud or theft. A well-known example is identification or debit and credit card information that goes astray, often in connection with the card being used to make a payment. In recent years, we have seen a major increase in the number of frauds reported. This is largely because computer fraud has increased. Computer fraud includes fraud in which a person uses another person's card details to make an online purchase.



**The number of frauds reported to the police is increasing, above all computer frauds using other people's cards**

*The figure shows that the reason for the increasing number of frauds reported to the police is primarily the rising amount of computer fraud. This is fraud where somebody uses another person's card details to make an online purchase.*

Source: Swedish National Council for Crime Prevention

The Swedish National Council for Crime Prevention carries out the Swedish Crime Survey (NTU), which aims to investigate people's exposure to crime, among other things. In the latest survey, just over five per cent of respondents reported that they had been exposed to card or credit fraud in 2017, which is a small increase from 2016, when the number was just below five per cent. In terms of value, fraud amounted to about 0.03 per cent of the value of card payments in 2016. This is slightly below the average for the EU as a whole, even though we have seen an increase in recent years. As all cards now have EMV chips and the magnetic strips are seldom used, frauds in shops and ATMs have decreased sharply. Fraud is now most common in e-Commerce, where the card is not physically present, particularly outside the EU.

Identity theft, which is a way of accessing another person's bank account, has been a growing problem in recent years. Today, there are many different types of identity document, and digital identification is becoming increasingly common. A government inquiry has proposed a new law and a new regulation on government identity documents with provisions on a government identity card and government e-identification. The Riksbank supports the proposal and considers that it could reduce the number of payment frauds. This, in turn, could lead to a strengthening of confidence in the financial system.

The growing problem of identity theft is a worrying development but several

current initiatives could help reverse the trend. Among these, the second payment services directive (PSD2), which has now been implemented in Swedish law, aims to increase consumer protection and improve the security of electronic payments. One example is the requirement for strong customer authentication. This means that a customer's payment transaction must be verified in two different ways. For example, a payment transaction can be verified with something only the user knows (a code), something they have (a payment instrument) or a unique characteristic (their fingerprint). The components used to verify a payment must stand alone to ensure that a payment cannot be executed in a situation in which a payment instrument or card details, for example, have been stolen. Another important element is the ongoing work of government agencies and market participants on information and education for the trade sector and consumers.

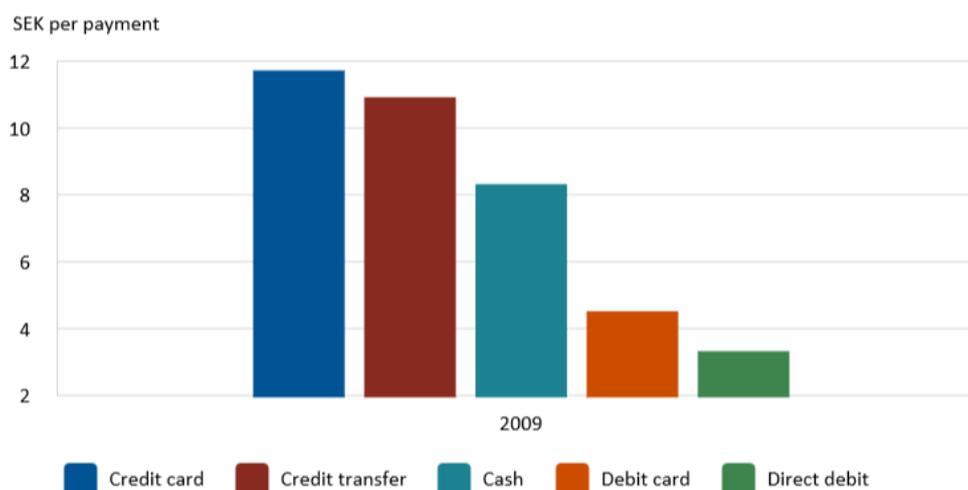
The Swedish people in general have a high level of confidence in most payment methods. Card payments, which are the most common method of payment for purchases in shops, command the greatest confidence, followed by cash and credit transfers. Invoice payments, purchases using payment apps such as Swish, and payments via online banking in e-Commerce also enjoy relatively high confidence. In 2013, confidence in payment apps was only 13 per cent, but, as it has become more common to use them, confidence in the method of payment has increased and amounted to 66 per cent according to the survey Sverige betalar 2017 (Sweden pays 2017).

### **Payment services and anti-money laundering activities**

The Anti-Money Laundering Act provides another reason it has become more difficult to deposit cash at bank offices. This Act forces payment service providers to prevent their payment service operations from being abused for money laundering purposes or the financing of terrorism. Payment service providers must therefore know who their customers are, where their money comes from and why they want to make transactions. Inability to provide a valid ID or supply a satisfactory explanation for why a certain service, such as a cash deposit, is being requested will result in the payment service provider being unable to provide the requested service.

### **Digitalisation makes payments more efficient**

*Digital payments are cheaper to execute than cash payments. An increasing proportion of digital payments thus contributes towards falling costs to society for payments. At the same time, the cost for each payment using cash increases as cash usage declines. Furthermore, access to payment services has deteriorated for certain groups.*



### Digital payments are cheaper to carry out for society as a whole than cash payments

*The figure shows that the economic cost to society for debit cards and direct debits is significantly lower than it is for credit cards, credit transfers and cash. A debit card is a card linked to the cardholder's account at a bank, from which the amount paid is debited directly. With credit cards, the amount does not have to be debited directly. The calculations are based on data from 2009.*

Source: The Cost of Consumer Payments in Sweden (Björn Segendorf, Thomas Jansson, Sveriges Riksbank Working Paper Series No. 262, June 2012)

### Digital payments are more efficient than cash

Payments are efficient if it costs relatively little for society as a whole to implement them. Society's costs include the payment intermediary's costs, such as costs for technical equipment, insurance, transportation and so on, but also other costs such as waiting times for an individual customer. The most recent investigation of society's costs for different types of payment in Sweden was published quite long ago, in 2012. According to that investigation, payments by debit card and direct debit were most cost-effective. For example, the overall economic cost for a payment using a debit card was about four kronor. The cost for each cash payment was twice as high, about eight kronor. Payments by credit card or credit transfer were the least cost-effective solutions. Here, the economic cost per payment was over ten kronor.

There are many indications that society's cost per payment in Sweden has fallen since then. For example, the payment solution Swish, in which account-to-account transfers are initiated by mobile telephone, has emerged to take over from cash payments. According to a more recent Danish study, the economic costs of the Danish equivalent to Swish are about two kronor per payment (person-to-person) and it seems reasonable to believe that something similar would also be true of Sweden. At the same time, the proportion of payments made using debit cards

and credit transfers has increased. Given the cost calculations described above, this indicates that the average economic cost per payment in Sweden has fallen.

However, the cost per payment using a certain payment instrument also depends on how many payments are made with that instrument. This is because large, fixed costs are often linked to each payment instrument. These large, fixed costs make each payment cheaper when the number of payments increases. This is an important reason for why the cost of paying with a debit card is significantly lower than the cost per payment of a credit card. In Sweden, significantly more payments are made with debit cards than with credit cards.

This effect also suggests that the costs for cash payments may have increased. When we make fewer cash payments at the same time as the largest part of the infrastructure remains, the average economic cost per cash payment increases. For electronic payments, we may have had the opposite effect, as the number has increased. A new cost study for Sweden would be necessary to give a more definitive answer to whether payments in Sweden in total have become more cost-effective. The Riksbank plans to conduct such a study next year with the aim of presenting the results in 2021.

Compared with other countries, payments in Sweden seem cost-effective. Cash usage is higher abroad, at the same time as more efficient electronic payment methods resembling Swish are used to a lower extent. According to a study from the ECB, published at the same time as the Swedish study, the cost per payment in Sweden was significantly lower than the cost in most other European countries.

Even if the cost of each payment has fallen, and even if the cost efficiency of Swedish payments is high compared with other countries, there is room for further streamlining. Among other things, greater availability and capacity in the systems for instant payments could contribute to increased competitiveness and innovation.

For a market to function efficiently, it is also important that the prices and fees paid by those using the payment services reflect the actual costs of a payment. Among other things, the planned cost study for Sweden must produce an overview of the costs for different payments and thereby create a better basis for assessing how well pricing is functioning.

### **Access to payment services has deteriorated for some**

The transformation of the payment market facilitated by the new technology is mostly beneficial. However, for some groups, primarily those who cannot or do not wish to use digital payment services, it can now be difficult to pay in certain

situations. Certain companies in the tourism sector and associations can sometimes have difficulty receiving payments. The Riksbank therefore welcomes the Government's proposed legal amendments to ensure access to cash and payment services.

## International payments need to be streamlined

*Payments to the EU are largely as fast and cheap as domestic payments. The same is true of payments within the global card networks such as Visa and Mastercard. Other international payments, on the other hand, are both slower and more expensive. New technology, including solutions based on cryptocurrencies, are now starting to be used in this area.*



### Payments to non-EU countries can take a long time

*The illustration shows that payments in Sweden and the EU reach the recipient on the same or following banking day. For payments outside the EU, it takes 0-5 banking days and sometimes even longer. Among other things, this is because more participants are involved in the transaction.*

Source: The Riksbank

## Payments within the EU are relatively rapid and inexpensive

Implementing a payment between two individuals with accounts in different banks requires information and money to be exchanged between the banks. An infrastructure is required for this to take place in a rapid, secure and straightforward manner. An international infrastructure exists for card payments. For other payments, such as credit transfers, the infrastructure is mainly constructed for payments within one currency area.

As the major Swedish banks are active in the euro area, neighbouring Nordic countries and a couple of other countries, they can initiate payments themselves in those countries' payment systems. For example, there is a payment system for euros and, as a consumer, you can often choose to make a so-called SEPA (Single Euro Payments Area) payment if you wish to pay in euros to somebody in the euro area. SEPA contributes a joint payment standard for the euro area, which

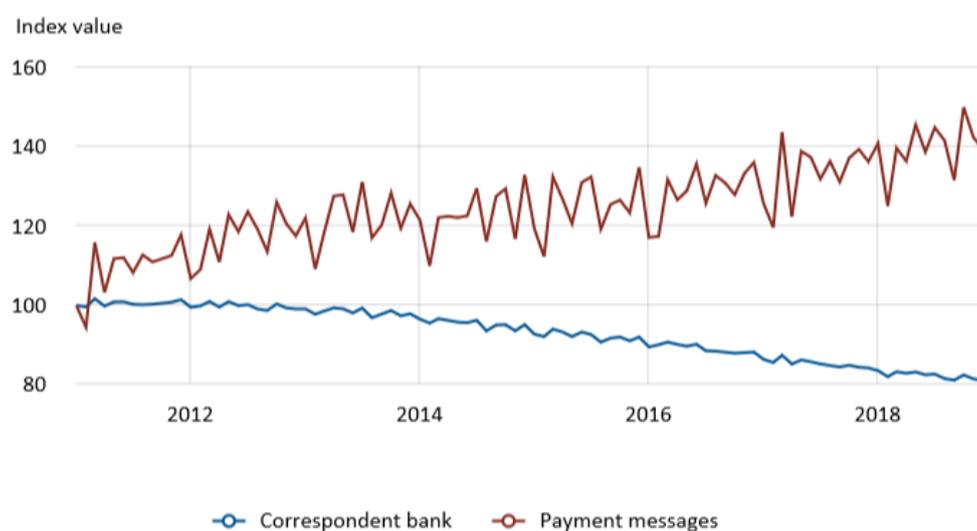
generally makes it equally quick and inexpensive to send money from a Swedish bank to a European bank as it is to make a transfer between two Swedish banks.

### **Payments to other countries are more complicated**

Payments to other countries than neighbouring ones or the euro area are more complicated. This is because the Swedish banks do not have direct access to those countries' payment infrastructures. The Swedish bank must then rely upon a network of bilateral agreements between banks in different countries, known as *correspondent banks*. These agreements are usually based on one bank (the correspondent) holding deposits owned by another bank (the respondent) and performing payments and other services on behalf of the respondent bank.

International payments are mostly sent over SWIFT's network for secure financial messages. SWIFT is the largest global supplier of standardised financial messaging services to financial actors in over 200 countries around the world. Although there are joint messaging standards for payment, correspondent bank payments are expensive and slow compared with payments within Sweden or the euro area. According to the Swedish Consumers' Banking and Finance Bureau, it can take up to five days for a payment to reach the recipient, sometimes even longer. In addition, it is difficult to gain an overview of the payment process as several banks may be involved. Sometimes it can be difficult to know how much a payment will cost and when it will be executed. Among other reasons, this is because the payment process is not automatic and, consequently, must often be handled manually. One further reason for the time it takes is that the central banks' settlement systems have limited opening hours and are located in different time zones. A payment can therefore be forced to wait for the system to open.

According to the BIS, increasingly strict legislation against money laundering and the financing of terrorism has contributed to a reduction of the number of correspondent banks by 20 per cent from 2011 to 2017. This is despite increased international trade and a greater number of transactions in the correspondent bank system. Above all, the reduction has taken place among smaller banks located in high risk areas where correspondent bank services entail an increased risk. If the present trend persists, the correspondent bank system risks becoming more fragmented, which could lead to less choice for customers.



### Fewer correspondent banks but more correspondent payments

*The image shows that the number of correspondent banks has fallen by about 20 per cent since 2011, at the same time as the number of payments moving through the correspondent bank system has increased by about 40 per cent. Note. Index 2011=100.*

Sources: The Riksbank and the BIS.

## Efforts for smoother international payments

A number of banks and innovative companies abroad and in Sweden are taking various initiatives to make international payments easier. One example is the Utility Settlement Coin (USC), which is run by 13 major international banks. USC can be seen as a bank-issued stablecoin intended for financial transactions. The banks' aim is to launch USC in 2020. Another example is a collaboration between a number of banks in Denmark, Finland and Sweden called P27, which has the ambition of creating a joint Nordic infrastructure for payments in Swedish and Danish currency and possibly also in Norwegian kroner and euros. A further example is provided by SWIFT's service GPI (Global Payments Innovation), which is a new standard for international payments that contributes towards increasing the speed, transparency and traceability of international payments.

Innovative fintech companies have also launched new products. For example, Ripple has created a blockchain-based system, primarily for interbank payments. Other fintech companies offer services to companies and private individuals. These services are often based on the fintech company itself combining and offsetting incoming and outgoing payments, more or less like a clearing house. This means that the number of payments that must ultimately be executed becomes fewer and for smaller amounts than the original payments, which reduces costs.

The problem of slow international payments has recently been pointed out by international organisations, the Riksbank and other central banks. This issue will continue to attract attention in the future. It would be positive if the central banks could find a good solution to reduce the need to use less secure private alternatives.

## The Riksbank is adapting to the digital world

*The Riksbank is analysing the possibility of modernising the Riksbank's money and system for rapid payments so that they are better adapted to a digital future. It is the Riksbank's ambition that all payments will eventually go via the Riksbank's system to safeguard the stability and efficiency of the market. The Riksbank has also pointed out that something must be done to slow down the rapid decrease of cash usage.*

### Rapid payments require innovation

*When new technology means that new types of company are processing payments, the Riksbank needs to adapt its systems and routines. In addition, demand is growing for instant payments around the clock. If the Riksbank ensures that it is simple and cheap to use its system for payments, there will be less need to use higher-risk alternatives.*

The digitalisation of society has come far in Sweden and affects all sectors, not least the payment market, which is under strong pressure for adjustment. Cash is used and accepted ever less frequently, online payments and payments with mobile apps are growing rapidly and new forms of 'money' in the form of what are known as cryptocurrencies have also emerged. At the same time, new actors want to enter the payment market, including global online platforms such as Facebook, Google and Amazon. As these often already have many users, they could rapidly gain a dominant position. It is not just the pace at which these technological innovations are being introduced which has increased, but consumer behaviour is also transforming rapidly. Many consumers expect it to be as easy and quick to make a payment as it is to send an email or text message.

The transformation of the payment market entailed by the new technology is mostly beneficial. Faster and simpler payments, round-the-clock availability and better range are making payments more efficient. But this development also involves new challenges. Cyber risks, vulnerability and dependence on electricity, the exclusion of certain groups and the infringement of privacy are some of the challenges that need to be managed. In this context, the Riksbank has expressed a desire for the obligation to accept cash to become more comprehensive. In a communication to the Riksdag, the Riksbank has also pointed out that it would be useful to investigate whether the concept of legal tender can be adjusted so that it also fulfils a function in a digital world.

These developments also demand the modernisation of the financial infrastructure that handles payments. Here, the Riksbank plays a central role by supplying the country with cash and by providing the central system for settlement of payments, which is conducted under the auspices of the Riksbank. Traditionally, the Riksbank's payment system, RIX, has only been open during office hours and the number of direct participants in the system has been relatively few. Opening hours were extended by an hour in 2019 and the number of participants will also probably need to be increased as other companies than banks are playing an ever greater role on the payment market. In the future, the system for instant payments will presumably be available around the clock.

The Riksbank's ambition is to meet the market's demands so that alternative, less secure solutions are not forced to appear. It must become possible to settle payments in Sweden in central bank money, 24 hours a day and 365 days a year. It would also be desirable to be able to make small transactions in real time to other countries in the not too distant future. If the Riksbank ensures that it is simple and cheap to use its system for payments, there should be less need to use higher-risk private alternatives for the settlement of international payments.

## **Digital cash: the e-krona project**

*The Riksbank is investigating whether it would be possible to issue kronor to the general public in electronic form, an "e-krona". This would allow the general public access to the Riksbank's money even in a cashless future.*

### **A digital complement to cash**

For 350 years, Swedish society has relied on the Riksbank to provide the country with money in the shape of Swedish krona. However, for some time, Sweden has gained attention as having the greatest and fastest decline in cash worldwide. This development is in line with the perception of Sweden as one of the countries in which the digitalisation of society as a whole has come furthest. Even if cash does not completely disappear, a situation in which cash is no longer generally accepted as a means of payment would be tantamount to a cashless society. The Riksbank has expressed concern over this development in a consultation response to the Riksbank inquiry, in speeches and in debate articles.

Technological advances and digitalisation of payments have brought to a head the question of the future role of the state in the payment market. If nothing is done, this development will very likely lead to the general public no longer having access to state-issued money, Riksbank money, which is the most secure form of money existing. This development has also resulted in certain groups in society, who are

unable to use digital services for various reasons, finding it increasingly difficult to make payments, a new kind of financial exclusion.

The Riksbank thus needs to consider whether cash needs to be modernised to fit into the digital economy. As part of this, the Riksbank started a project in the spring of 2017 to examine the scope for the Riksbank to issue a central bank digital currency (CBDC), an “e-krona”.

An e-krona would give the general public access to a digital complement to cash, where the state would guarantee the value of the money. At present, only the banks and other participants in RIX have access to the Riksbank’s digital currency. All other digital money in society is issued by the commercial banks.

By definition, an e-krona would also be a digital form of payment, but it could be designed with the aim of including all groups in society. Easily accessible, simple and user-friendly versions could be developed for those who currently have difficulty with digital technology.

In addition, an e-krona could form its own separate system that would strengthen the resilience of the payment system. In the event of serious shocks to the systems of the banks or card companies, an e-krona could be an alternative form of payment. An e-krona would thus fulfil the same task that cash fulfilled so well in the analogue era – providing a state payment alternative that is available to all and that complements the range of private services.

In the e-krona project, the Riksbank has had a dialogue with several national and international agents to hear their views on an e-krona, has looked at proposals for suitable technology and has examined the legal issues that need to be dealt with to ensure the Riksbank has a clear mandate to issue an e-krona.

Continued dialogue with the general public, payment market participants and other central agencies will be important. No decisions have been taken to issue or not to issue an e-krona, but by continuing to examine the possibilities, the Riksbank is preparing a possible way forward towards meeting a new digital payment market.

### **Many central banks investigate central bank digital currencies**

The technological shift entailed by digitalisation affects all countries, albeit at varying speeds. Central bank digital currency is therefore something that is being investigated by many central banks around the world. This work was initially theoretical but many have also started pilot studies and tests to learn more about how it could work in practice.

There are also solutions that are not central bank digital currencies but in which private money is backed up to 100 per cent by reserves at the central bank. For example, China has introduced regulations meaning that payment service providers such as Alipay must back their customers' holdings to 100 per cent using central bank reserves.

## **The Riksbank intends to use TIPS**

*A new technical solution is needed so that an increasing amount of payments can be made rapidly and efficiently. The Riksbank is thus planning to use the European Central Bank's system for instant payments, TIPS, where Swedish kronor can be used.*

### **Swish enables instantaneous payments**

In today's digital society, it is possible to send information in seconds, but it can still take several days for a payment to reach its recipient. The mobile service Swish, which was introduced in 2012, makes it possible to send instant payments. This means payments where funds are moved in seconds from an account in one bank to an account in another bank, around the clock, every day of the year (24/365). At present, the service only works between Swedish banks, but Swish has initiated cooperation with other European companies offering mobile services for instant payments so that instant payments will also become possible within Europe.

### **Strengthening needed in the future**

Households and companies are expected to demand instant payments to an ever greater degree and, eventually, new arrangements dimensioned for larger payment flows will probably be needed. In 2018, Swish was responsible for six per cent of the total amount of electronic payments in Sweden. The Riksbank considers that more payments could be made instantly if customers wished. Unlike all other payments, Swish payments are settled via a private technical platform and not through the Riksbank's payment system RIX. As the importance of instant payments increases, so too do the consequences for society of potential shocks to the flow of payments. It is therefore important that instant payments are also settled at the Riksbank.

The Riksbank has therefore investigated how it could ensure that instant payments could be made around the clock directly via the Riksbank. One possibility is for the Riksbank itself to develop or procure a platform for instant payments. This could be very expensive. Another aspect is that payments have

considerable economies of scale, which is to say that efficiency gains can be large if payments are made on a large scale.

The Eurosystem already has a platform for the settlement of instant payments. The platform is called Target Instant Payment Settlement (TIPS) and was launched in November 2018. TIPS has the technical capacity to execute payments in other currencies than the euro, for instance, the Swedish krona (SEK). It would thus be possible to use TIPS to execute instant payments in SEK in a very efficient and secure manner.

In the autumn of 2018 and spring of 2019, the Riksbank carried out a pre-study of the advantages and disadvantages of enabling payments in SEK via TIPS. The result of this was that the Riksbank decided to continue to work with the ECB to develop an agreement allowing this. An agreement would involve the Riksbank using the TIPS platform to settle instant payments and RIX would therefore be expanded to also cover parts of the TIPS platform. An important part of the coming negotiations is ensuring that the platform meets national security requirements. The aim is for the new service to come into use in 2021.

## Government inquiry into the digital payment market

*The Riksbank has submitted a proposal to the Riksdag to review the state's role on the digital payment market. The Riksbank proposes a committee be appointed to investigate whether the Riksbank should have the possibility to issue an e-krona and whether this could be given the status of legal tender.*

The question of whether Sweden should introduce a state-issued digital krona, or e-krona, is one that will affect the whole of society. The Riksbank has therefore also asked the Riksdag to appoint a committee to review central bank money's role in a digitalised economy and investigate whether the Riksbank should have the right to issue electronic money. The committee should also review the role and responsibility of both the state and the private sector on the payment market.

In most countries, there has long been legislation stipulating that money issued by the central bank is to be legal tender. This means that it must be possible to pay with it everywhere, unless a contract specifying payment by other means has been entered into. In Sweden, it is becoming more and more difficult to pay with the Riksbank's money – cash. This is because there are costs and risks associated with cash that are leading some restaurants and shops to choose not to accept it once the number of customers wishing to pay with cash has become small

enough. A sign saying that cash will not be accepted is all that is needed to enter such a contract.

Consequently, for the concept of legal tender to remain relevant in a digital future, the Riksbank has also proposed, in its submission to the Riksdag, that the committee be assigned to conduct a review of the concept of legal tender.

The Riksdag has urged the Government to appoint an inquiry in accordance with the Riksbank's proposal.

## **Strengthened preparedness in the financial sector**

*The Government has decided to resume Sweden's total defence, which is to say all activities needed to prepare Sweden for war. The financial sector thus needs to further develop its crisis preparedness to be able to manage a situation of a heightened state of alert. The Riksbank is coordinating the planning that has been initiated together with other involved authorities.*

### **Sweden's total defence has been resumed**

Due to the deteriorated security policy situation in Europe, the Government has decided to resume Sweden's total defence. The term total defence denotes all activities that are needed to prepare Sweden for war. In the report *Motståndskraft - Inriktningen av totalförsvaret och utformningen av det civila försvaret 2021–2025 (Resilience – The total defence concept and the development of civil defence 2021–2015)*, the Swedish Defence Commission noted that the financial system could be a direct target or could be indirectly exploited in some form of attack. It is therefore important that the financial sector further develop its crisis preparedness.

The Government has given the Swedish Armed Forces and Swedish Civil Contingencies Agency the assignment to ensure that there is coherent planning for total defence. As there is no designated sector-responsible authority for the financial services sector, the Riksbank is coordinating the planning that has been initiated together with other involved authorities within the financial services sector.

### **Prerequisites for payments during a heightened state of alert**

The Riksbank's position is that several prerequisites must be met in order for payments to function during a heightened state of alert. Among these, there should be a variety of alternative means of payment and a robust supply of

electricity and electronic communications. Cash is also dependent on these infrastructures.

A large part of the critical activities in the financial sector is conducted by private actors, and the civil defence efforts therefore need to be carried out in close collaboration between public and private actors.

### **The Riksbank to participate in the Total Defence Exercise 2020**

The Swedish Government has decided to reinforce Sweden's national defence capacity. As part of the efforts, the Total Defence Exercise 2020 (TFÖ 2020) will be held under the command of the Swedish Armed Forces and the Swedish Civil Contingencies Agency (MSB). TFÖ 2020 will be held throughout 2020 and consist of various exercise activities. The Riksbank will participate in the exercise together with other organisations representing financial services.