



# SPEECH

DATE: 3 May 2011  
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LOCALITY: Cards and Cash Payments Forum, Stockholm

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## ■ Will cash replace cards?<sup>1</sup>

Since the latter half of the 19th century, the theory of evolution has gained general acceptance. It is considered to be self-evident that better-adapted species will outcompete those that are less-well adapted. Environmental changes may even lead to some species becoming extinct. There are no longer any sabre-toothed tigers or mammoths because the Ice Age is over. A new species may also be superior to another species in a crucial way. This is why we no longer see Neanderthals walking the streets. Nevertheless, some other amazingly old species are still with us. Crocodiles have been around for 85 million years and the coelacanth, if I am correctly informed, can be traced back 400 million years!

An evolutionary process, although of a slightly different kind, is now also taking place on the payment market. Rapid technological development is changing the world around us. New payment methods are arising. Bank cards and credit cards have become a natural part of our everyday lives, as has Internet banking. In Sweden, cheques have been outcompeted and are hardly used at all. The number of paper-based giro payments is falling rapidly and it also appears that the use of cash is declining. The value of the banknotes and coins in circulation has fallen from 9.6% of GDP in 1950 to 2.9% in 2010. So, the question is: Should cash be compared with the extinct Neanderthals or the surviving Crocodiles?

But why is this of interest to the Riksbank? Well, a first obvious answer is because it is the Riksbank that issues banknotes and coins. Another, and more complicated, answer is because one of the tasks of the Riksbank is *to promote a safe and efficient payment system*. This may sound a little high-flown, but it means, among other things, that we should *promote the development of safe and efficient payments*. This is why we have a natural interest in cards and cash. Hence, we are interested in the evolution of the market for payments, and that is why I am standing before you today.

What I intend to talk about today is why I believe that cash will continue to play an important role in our payment system for the foreseeable future (even though not 85 million years) and why cards and other technological developments will not be able to fully take the place of cash. Ironically, part of

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<sup>1</sup> I would like to thank Björn Segendorff for his contributions to this speech.

■ the explanation for this lies in the strong position that debit and credit cards hold on the Swedish market. As usual I would like to make clear that my speech is an expression of my own views and that it may not necessarily be shared by my colleagues in the Board of the Riksbank.

## **Cards and cash in Sweden**

Cards compete with cash when we pay directly at the point of sale, for example in supermarkets, petrol stations, restaurants or at cinemas. It is the customers who choose how they want to pay, and as we no longer use cheques in Sweden the choice is between cards and cash. A high level of card usage thus tends to go hand in hand with a low level of cash usage, and vice versa.

In Sweden, the use of cards has increased rapidly in recent years. In 2009, the average Swede made 182 card payments but less than 30 cash withdrawals. This means that the value of the payments made by card has increased fivefold, and that the number of card payments has increased more than sevenfold, over the last 10 years. Unfortunately, there are no corresponding statistics for cash payments, but if we assume that the cash withdrawn from ATMs is used to make purchases then the value of all the card payments is three times higher than the value of all the over-the-counter cash payments. Another way of measuring cash usage is to compare the value of the banknotes and coins in circulation, which is usually referred to as MO, with GDP. If we do this we can see that between 2001 and 2010, MO fell from 3.8 per cent to 2.9 per cent of GDP. Approximately two-thirds of the payments in the retail sector are made using cards, with some reservation for the fact that it is difficult to measure the number of cash payments in the economy exactly.

The situation in Denmark and Finland is roughly the same as in Sweden. In Sweden's case this means that we have really caught up since the beginning of the millennium when we used cards only half as much as our Nordic neighbours. In a broader international perspective, we use cards to a relatively high extent in Sweden. This particular combination of low cash usage and high card usage is unique to a limited number of countries, including the Nordic countries and Canada.<sup>2</sup> Some countries, for example the United States, have high levels of both card usage and cash usage, but we must also bear in mind that a proportion of the United States' banknotes and coins is in circulation outside the country. This applies to the euro area too, but the level of card usage is much lower there.

## **Why is cash used?**

Why do people choose to pay in cash? There are several reasons. First, paying in cash is quick and easy for small sums. Handing over the exact sum in cash to buy an evening newspaper, for example, may be quicker than using a card. In a survey commissioned by the Riksbank in the autumn, 59 per cent of the respondents said that they preferred to pay in cash for sums below SEK 100. For sums between SEK 100 and SEK 500, 22 per cent said that they prefer cash. Second, it appears that cash imparts a sense of security and our survey showed that 65 per cent felt very secure about using cash as compared to 35 per cent for cards. The term security may mean many different things, but the feeling of

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<sup>2</sup> This comparison is based on cash usage measured as the value of the banknotes and coins in circulation (MO) in relation to GDP and on the number of card payments per person and year.

■ having the entire transaction under control is central. A card transaction may feel less concrete and be harder to understand. It may also be difficult to estimate the risk of fraud, for example as a result of skimming. We know that older people are much more prone to use cash and less prone to use cards than younger people. The difference is also substantial. Third, appropriate substitutes for cash are not always available. Although cards are accepted almost everywhere, there are few alternatives when it comes to payments between private individuals, for example on second-hand markets on the Internet. Using your Internet bank in the evening to make a transfer between two bank accounts in order to pay for a sofa is not always a smooth and easy alternative to cash. It was in such cases that cheques performed an important function. Fourth, cash is one way of storing a value and it is often wise to maintain a certain liquidity reserve in the form of cash.

However, despite everything I have said about the use of cash in Sweden and internationally, there is a lot that we do not know or cannot explain. The Riksbank conducted a study in 2007 with the aim of investigating how large a proportion of the cash in circulation could be explained on the basis of what we know about cash usage.<sup>3</sup> The study was based on available statistics on retail sales, secondary markets, liquidity buffers, lost or destroyed banknotes and coins and a number of other factors. Despite this we were unable to explain more than around 40 per cent of the value of the banknotes and coins in circulation. Although the study did not reach beyond 2004, I dare to claim that we still cannot explain what a large proportion of the cash is used for. Part of the explanation may be that the public has more cash at home, as a buffer, than we believe. Unfortunately, it is difficult to get good statistics on things like this as people may feel it is risky and sensitive to say how much cash they have at home. Another explanation is that cash is used in the shadow economy, for example for various household services such as repairs and cleaning.

There are thus a number of good reasons that explain why we use cash and why we will continue to do so for some time to come. For this reason alone there is a lower limit below which cash usage cannot fall. Where exactly this limit lies and how quickly we may reach it will largely depend on what other payment services are developed. For payments from private individuals to companies there are a number of competing services such as card payments, mobile payments, Internet transfers and so on. However, for payments between private individuals there are far fewer alternatives. Despite the rapid rate of technological development, no satisfactory replacement for cheques has emerged in this context.

### **What is required to make new payment services successful?**

There are a number of fundamental characteristics of the payment system that affect the chances of successfully launching new substitutes for cash and other existing payment services. Some of these characteristics raise barriers to innovation and may thus help to protect the already established payment services. If we assume that, in one way or another, new payment services will be based on payment by electronic means between accounts in one or several custodial institutions, then there are at least three problems that a payment service must overcome in order to succeed.

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<sup>3</sup> Guibourg, Gabriela and Björn Segendorff (2007). The Use of Cash and the Size of the Shadow Economy in Sweden. Sveriges Riksbank Working Paper Series, No. 204.

■ First, launching a new payment system is in itself costly. On the other hand, it is in general not much more expensive to produce a large number of payments than a small number of payments due to the benefits provided by economies of scale. However, it takes some time before a new system can reap these benefits. The costs for building, manning and maintaining such a technical system are rather high and it is only when the system is in place that costs begin to fall. Then the cost of processing an additional payment is almost zero. The average cost of making a payment thus falls as the number of payments increases. The price per transaction that the producer can charge without running at a loss is therefore low. Already established payment services that handle large volumes of payments therefore have a cost advantage. The larger the volume the established service has, the greater is its advantage. The situation for a new service is exactly the opposite. At least initially, a new service will have a small number of payments to distribute the fixed costs between. In order not to price itself out of the market, the new service will have to run at a loss until it has achieved a sufficiently high volume. A new service thus has a significant cost disadvantage compared with an established service.

Second, a new system has to compete against the so-called network effects. The classic example of a network effect is telephony. Being the first person to have a telephone offers no advantages. If two people have telephones they can at least call each other, which has a value. For every new telephone owner that is linked to the telephone network the benefit of having a telephone to those who are already connected increases as the number of people that can be reached has now increased. This reasoning about telephony can easily be applied to payment services where everyone wants to be able to send payments to and receive payment from everyone else, for example a service for payments between private individuals (P2P).

The reasoning becomes more complicated when we talk about payments from consumers to companies (P2B). Payment service markets with two distinct sets of customers for payment services and payment flows in only one direction are usually called two-sided markets. The market for point-of-sale payments (POS) is one such two-sided market. The payments on this market go from the private customer to the company and not the other way. The card market is only attractive to merchants if there are a sufficiently large number of consumers with cards. Similarly, it is only attractive for consumers to have cards if it is possible to use them in a sufficiently large number of shops. A new payment service on a two-sided market must solve this "chicken and egg" problem, that is ensure that sufficient numbers of consumers and merchants start using the service. Launching a product that is not fundamentally based on existing payment services thus entails major problems. The banks managed to solve this problem for card payments, but just consider how long it took to achieve the volumes that we see today. Consider also the fact that the banks did not manage to solve this problem for an e-money product called Cash Card that was finally phased out a number of years ago.

A natural consequence of network effects is that those who are already connected to a well-developed network, for example for card payments, will think carefully about whether it is worth connecting to a new network that is currently much smaller but might in the future be as large or larger than the existing network. There is a risk of not being able to reach as many payers and payees in the new network. It may thus be better for consumers or merchants to wait and perhaps join the network later when a critical mass of users has been achieved. Launching a service that is not based on an established network

■ is therefore much more difficult and more costly than adding new services to an established network.

Third, it is easier and less costly for established payment mediators to launch new products as they have the advantage of having already attracted a circle of customers that buy their services. These customers can easily be reached through the relationship that is already in place. The customers also already have an account with the mediator, usually a bank, which can be used as the basis for new payment services.

The established players also have an advantage in that their relationship with the customers gives rise to a certain lock-in effect, that is changing from one service supplier to another, for example from one bank to another, may entail certain costs for the customer. It may be the case that the local branch of the new bank is further from the customer's home, the legal terms and conditions governing the payment services may be different, the customer service centre may be slower, the personnel may be less friendly and so on. Getting private individuals to change their bank has proved to be much more difficult than expected. The new alternative service must be better than the existing payment service by a broad margin in order to make changing from one service provider to another an attractive prospect. This affects what innovators will be able to charge for their new services, and thus reduces their incentives to launch such services.

However, despite such difficulties, there are examples of very successful launches of innovative payment methods. One such example is the introduction of M-PESA in Kenya in 2007. M-PESA is a mobile payment service based on SMS and was launched by the leading mobile operator, Safaricom. One of the points here is that a large part of the population had mobile phones but not bank accounts. The mobile operator thus had a large, well-established circle of customers and thus an advantage. By first launching M-PESA as a service for payments between private individuals, the company was able to focus on getting one group of customers to connect to the service. This made it possible to exploit the existing network effects immediately and completely. Once the private customers were connected and were using the service, the time was ripe to also offer it to merchants. In this way the company got around "the chicken and egg" problem. Finally, the company already had access to the required IT platforms and communications equipment as part of its standard business operations. This made it possible to avoid high investment costs and to exploit advantages of scale by producing payment services using the existing infrastructure. Nor was there any competition from any other product. A well-developed business concept thus made it possible to overcome all the barriers I mentioned earlier.

## **Cash usage in the future**

But what does all this mean to the use of cards and cash in the future? Will cards be outcompeted by new products and will cash gradually disappear entirely? I don't think so.

Assume that someone wants to launch a new payment service for everyday payments and that this service is not based on any existing payment service. If it is to be anything more than a niche product it will have to compete with cards. However, high initial costs combined with the strong position of cards in terms of low costs, extensive networks and a reliable circle of customers at the

■ banks who are used to handling cards present strong barriers to such genuinely new payment services. Remember that M-PESA's success is based on the fact that only a small part of the population had bank accounts and that cards were unusual. The situation in Sweden is entirely different and as far as Sweden is concerned I do not think that the threat to cash (or cards) comes from a genuinely new product.

One alternative to building an entirely new payment service is to further develop an existing service. This could relate to a new way of initiating card payments, for example by using mobile phones. In this way the new service would benefit from the advantages of scale and network effects provided by the existing service. The initial investment would also be lower as the infrastructure is already in place. The barriers to such payment services are lower than for genuinely new payment services and it is probable that development of this type would primarily be pursued by the existing players on the payment market, possibly in cooperation with an external party such as a mobile operator. Swedbank and Payair are currently running a pilot project in Uppsala on the initiation of card payments by mobile phone. Such solutions may reduce card usage in the retail sector if they are perceived to safe and easy to use.

The role played by cash in payments from customers to companies is declining steadily, but the position of cash as a means of payment between private individuals is still strong. Unless cash is superseded in this area of usage, it will continue to play an important role in our payment system. I therefore believe that the major challenge to cash will come if a new payment service appears that could be used to make quick and safe payments between private individuals. There are interesting projects and products that may threaten cash in this respect. Sweden is well to the fore in this field and the Swedish banks are working on an interesting mobile phone-based service for person-to-person payments in real time.<sup>4</sup> Square is another interesting product, as yet only available in the United States, that allows card payments to be made between private individuals by connecting a small card reader to a mobile phone.<sup>5</sup>

Whatever path technological development takes, it will probably mean that the use of cash continues to decline. We will have more payment services to choose between and competition will increase. How far the use of cash is pushed back will depend on what alternative payment services are established. The same barriers that protect cards against competing products will also protect cash to a certain extent. But, above all, cash is simple and easy to use as a means of payment, especially for small transactions. This is appreciated by the consumers and it has proven to be quite difficult to change consumer habits. It will be exciting to follow developments. Evolution will follow its inexorable course. However, cash will survive, like the crocodile, even though it may be forced to see its habitat gradually cut back.

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<sup>4</sup> Press release from the Swedish Bankers' Association, 24 March 2010.

<sup>5</sup> Squareup.com