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Swipe, scan, tap: the cashless payments market

Money Market Event

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Ladies and gentlemen

How did you pay for your lunch today? Did you use cash, hold your card or smartphone up to a payment terminal, or scan a QR code? This decision will typically depend both on personal preference and on the specific situation at the physical point of sale. But economic and technological factors also play a role in the choice of payment method.

My colleague Thomas Moser and I are pleased to explain to you today how cashless payments work, both technically and economically. We will approach this from a macroeconomic perspective and examine the challenges involved in maintaining an efficient and resilient payments system. We will then discuss the SNB's role in cashless payments and outline how we contribute to overcoming these challenges.

How the Swiss pay at the cash register

Let us start with developments at the cash register. According to the SNB's payment methods surveys, the habits of households have changed significantly in recent years. You can see the figures on the slide. Cash is still used in around 30% of all transactions at cash registers, debit and credit card payments together account for around 50%, and mobile payment apps for around 20%. Over time, the use of cash – a medium that has been around for millennia – has declined; on the other hand, the trend for cards, which we have all been using for around 50 years, is stagnating. Mobile payment apps, which only emerged about ten years ago, are recording the fastest growth in usage.

When we pay for something, we rarely think about how the payment process works technically, and how economic mechanisms affect the supply – and our use – of payment methods. To make this more tangible, let us start by looking into the engine room of cashless payments.

Technical functioning of cashless payments, and economic incentives

The main difference between cash and cashless payment methods is that cash, as a physical asset, is transferred directly from one person to another, whereas cashless payments are settled electronically and include intermediaries. The slide shows the different players involved in a cashless payment:

- On the far left of the chart we have the customer, who is paying for a purchase with a card.
- On the far right we have the retailer who is accepting the card payment.
- Between the customer and the retailer are service providers, shown here with a blue background. They provide the customer with a card and ensure that the retailer can accept the payment. There are two types of service provider: The so-called 'issuer', shown to the left on the customer side, issues the card or the mobile payment app. And the 'acquirer', on the right, provides the retailer with the payment terminal at the cash register.

- The payment networks,¹ shown here in the yellow area, are the link between issuer and acquirer and are responsible for the flow of information. Many payment terminals at the cash register display their logos, indicating which payment network can be used. In Switzerland, the companies Mastercard, PostFinance, TWINT and Visa dominate.

All these intermediaries are involved in the payment process when a customer makes a cashless payment at a retail store. Let us take a look at the technical process using a card payment as an example.

When the customer uses their payment card at a cash register, the payment terminal immediately sends a request via the acquirer to the payment network. The payment network asks the issuer whether the payment can be made, and the issuer in turn contacts the customer's bank. If the bank grants approval to the issuer, the payment network sends the confirmation back to the acquirer. At this point, for the customer and the retailer, the transaction is complete.

However, the actual transfer of the funds does not take place until later – usually a day later, but in extreme cases even a month later. The funds flow from the customer's bank, shown in light blue, via the settlement infrastructure, shown in green, to the retailer's bank. In Switzerland, such interbank payments are processed via the Swiss Interbank Clearing (SIC) payment system, which SIX Interbank Clearing Ltd operates on behalf of the SNB.

That was the technical perspective. Now let us switch to an economic view and consider the market forces shaping cashless payments.

First, let us simplify our previous illustration. In the middle we see two areas, one in yellow and one in green. These areas represent platforms via which information or payments flow between the players shown in the blue areas. On the one hand, information flows via the payment networks, shown in yellow, where customer payments are processed. On the other hand, funds flow via the banks' settlement infrastructure, shown in green.

Network effects and economies of scale are in play in both the yellow and the green areas. When we speak of network effects, we mean that the more users a platform has, the more attractive it becomes to each and every one of those users. With large numbers of transactions, economies of scale also enter the equation. These arise because setting up and maintaining the infrastructure entails high fixed costs, while the additional costs of a single transaction are very low. If the fixed costs are spread over a large number of transactions, average costs per payment decrease. These two effects – network effects and economies of scale – can lead to strong market concentration on certain platforms, and sometimes even to a monopoly.

However, there is a significant, economically relevant difference between the settlement infrastructure and the payment networks. In the case of the settlement infrastructure, the platform users on both sides are typically banks. The payment networks, by contrast, function as platforms that bring two different user groups together. On the left are the customers. On

¹ Payment networks, also often referred to as 'schemes', define the technical standards, business rules and roles of the various players.

the other side are the retailers. In economics, this kind of arrangement is known as a two-sided market.

We will now examine what specific effects a two-sided market has on incentives and price-setting.

In two-sided markets, interactions take place between the two user groups. The more retailers there are in the payment network, the greater the benefit for customers. And the more customers there are, the more attractive the payment network becomes for the retailers. This interdependency and the different characteristics of the two user groups enable the payment network to maximise its profit by setting prices differently for the two groups.²

Everyone who uses a credit card knows this. In a credit card transaction, customers do not generally pay a transaction fee to the payment network. On the contrary, they often even receive a small reward – for example in the form of bonus points, cashback or insurance benefits.³ The costs of these rewards are part of the fees retailers pay for each transaction.⁴

Retailers, for their part, finance these fees by raising prices slightly for all customers, irrespective of the payment method chosen, or by making savings elsewhere.⁵

To understand this better, imagine Thomas and I are going for an espresso. Thomas pays for his espresso with his debit card, while I use a credit card that rewards me with air miles when I make payments. In order to finance these air miles, the café owner has to charge higher fees for my payment than for Thomas' payment. The café owner then factors these costs into the price of the espresso. Since Thomas and I are both paying the same price for an espresso, Thomas is indirectly co-financing my air miles.

For payment networks rewards are a suitable means of attracting and retaining users. However, from a macroeconomic perspective, this can be inefficient. What do these economic considerations mean for the ideal payment system?

Characteristics of a macroeconomically optimal payments system

Payments are the backbone of a modern economy. Virtually no goods would change hands and virtually no services would be provided in today's world without a functioning payments system. From a macroeconomic perspective, resilience is therefore an overarching objective in the payments system. The payment methods must be secure and, where possible, available continuously; and they must be technically reliable and widely accepted. Resilience is also

² Fundamentally, the direction of price asymmetry depends on how much a user group contributes to the attractiveness of a payment network and how price-sensitive this group is compared to the other. The greater its contribution to the attractiveness and the more price sensitive it is, the lower the price it will be charged.

³ Since in the example used the customer typically exerts a stronger influence on the retailer side than vice versa, and since retailers are less price sensitive because they can often pass the fees on to their sale prices, the price structure usually ends up favouring the customer.

⁴ This mechanism only works if the retailer does not adjust the sale price of the goods or services to the customer's payment method, e.g. by granting them a discount depending on the payment method used. This is indeed the case in Switzerland. Generally speaking, acquirers contractually oblige retailers to offer all cashless payment methods at the same price ('no-surcharge rule').

⁵ These fees finance the rewards and also cover the general costs of the payment network.

achieved through redundancy. If one payment method (e.g. a debit card) fails, an alternative payment method (e.g. cash) must be available in order for the desired transaction to take place.

Cash makes a significant contribution to resilience by virtue of being independent of digital technology. The SNB has a statutory mandate to ensure the supply and distribution of cash, and we are convinced that there will continue to be demand for cash in the future. We are therefore working on a new banknote series to be issued in the 2030s.

The second overarching objective in the payments system is efficiency. But what do we mean by this? From the customer's point of view, the payments system must offer a good cost-benefit ratio, provide alternatives and be secure. Customers also welcome reward schemes, but the costs borne by retailers must also be taken into account when assessing efficiency from a macroeconomic perspective.

This brings us to the question of how we can achieve efficiency in the payments system. Is strong competition the answer?

Competition and efficiency in cashless payments

The answer is 'yes and no'.

For an efficient payments system, competition among service providers – banks, issuers and acquirers (blue areas in the chart) – is desirable. These players are at the interface between the customers and the retailers. A broad selection of payment options and intense competitive pressure promote efficiency here.

However, the central settlement infrastructure (the green area in the chart) can be regarded as a natural monopoly due to economies of scale and network effects. From a macroeconomic point of view, it is most efficient to have a single provider to which all users – in this case the banks – are connected. By entrusting the operation of the settlement infrastructure to SIX Interbank Clearing Ltd, the SNB ensures that the monopoly position is not abused.

With regard to payment networks (the yellow area in the chart), neither a monopoly nor a market with many competitors is desirable. Let us look at this in more detail.

On the slide, we plot the level of competition on the horizontal axis and the level of efficiency on the vertical axis.

Due to their economic structure, two-sided markets tend to be highly concentrated. Once a provider reaches a critical number of users, it attracts even more users due to powerful network effects. From a macroeconomic perspective, the exploitation of these effects is positive. Economies of scale are also in play. Furthermore, in a highly concentrated market, the incentives to attract and retain customers via inefficiently generous reward schemes are less pronounced.

More competition, on the other hand, promotes innovation and the development of alternative payment methods. It also strengthens the customer focus of providers. Moreover, if there are

many active providers, it is easier to switch to another payment method if technical problems arise. Competition thus increases resilience in the payments system.

In order to achieve high efficiency and resilience at the same time, neither a monopoly nor perfect competition is optimal when it comes to payment networks. From a macroeconomic perspective, a balanced amount of competition is desirable. As economic forces tend to drive the creation of monopolies, it makes sense to consider competition-enhancing measures.

So how can we promote competition in a two-sided market and be certain that we are genuinely improving efficiency?

First of all, competition can be strengthened through antitrust regulations. One issue that the Swiss authorities are currently discussing intensively with market participants is the level and allocation of fees charged by payment networks. Setting standards for these fees can improve efficiency.

Competition can also be increased by lowering barriers to entry. In the payments system, which features a multitude of players, open interfaces are an important means of achieving this end. Open interfaces allow new providers to become part of the payment process by linking their services with those of other players – a process known as ‘interoperability’.

Where are these interfaces? One example is the payment terminal at the cash register. This is the interface between the customer, the acquirer and the payment network. If this interface is completely open, the retailer can offer the customer a broad range of payment options.

However, it is also conceivable that a payment terminal would only allow a QR code to be scanned for a specific payment network. This would close the interface to other payment networks, preventing free competition.

Another example is the near-field communication (NFC) interface. NFC technology enables a contactless connection to be established between two devices, such as a smartphone and the payment terminal at a cash register. The smartphone operator may close this interface for certain applications, or high fees may be charged for the use of the NFC interface. Both approaches restrict competition.

From a macroeconomic perspective, such barriers to entry should be lowered, thereby facilitating interoperability.

SNB policies and initiatives

Before concluding, we would like to address the SNB’s role in the payments system.

As part of its statutory mandate, the SNB facilitates and secures the operation of cashless payment systems. Interbank payments are settled in central bank money via the SIC system. The SNB also supports the use of central bank money in retail payments, i.e. for payments made by households and companies. In doing so, we increase the resilience and efficiency of the Swiss payments system.

We also contribute in a number of ways to interoperability in the payments system. We will now look at three examples.

The first example is our established, tried-and-tested access policy, which governs who can settle payments directly in central bank money. By international standards, the SNB pursues a very open access policy. It takes a principles-based approach – institutions with comparable economic functions and risk profiles may use the SIC system, provided they meet specified conditions.⁶ Besides the banks, licensed fintech companies, for example, are eligible for access. In this way, we promote competition.

A new project aimed at increasing interoperability in the payments system is the Instant Payments Bridge. A year ago, we spoke about instant payments at our Money Market Event in Zurich. Instant payments allow account-to-account bank transfers to be made within seconds, and around the clock. Such payments are not yet possible at the cash register. The Instant Payments Bridge aims to change this by giving payment solution providers technical access to the instant payments settlement infrastructure. The emphasis is on ‘technical access’ as the banks will continue to control the settlement of payments.

Another undertaking is the ‘interlinking project’: Together with the European Central Bank, we are exploring how the Swiss and European settlement systems for instant payments could be linked. An implementation of the link would enable cross-border instant payments. This would increase interoperability and speed in international payments.

With its open access policy, the Instant Payments Bridge and the interlinking project, the SNB is improving interoperability in a targeted manner, thereby lowering barriers to entry in the payments market. In so doing, we are strengthening the efficiency and resilience of the payments system – both domestically and in a cross-border context.

Conclusion

That brings us to the end of our remarks. The SNB’s payment methods surveys show that payment habits in Switzerland are changing. Cash remains important, but cashless payment methods are becoming increasingly popular.

Cashless payments are characterised by complex technical and economic mechanisms. Given the growing importance of this payment method, how can the SNB, within its statutory mandate, increase efficiency and resilience in cashless payments? What do we need to pay attention to? To answer this question, it is important to engage in dialogue with the various market participants. With this in mind, we look forward to your questions and to the panel discussion afterwards.

⁶ Cf. Instruction sheet on admission to the SIC system and sight deposit accounts (www.snb.ch/sicgiro_access_en).