Analysis

COVID-19 pandemic causing permanent change in payment habits

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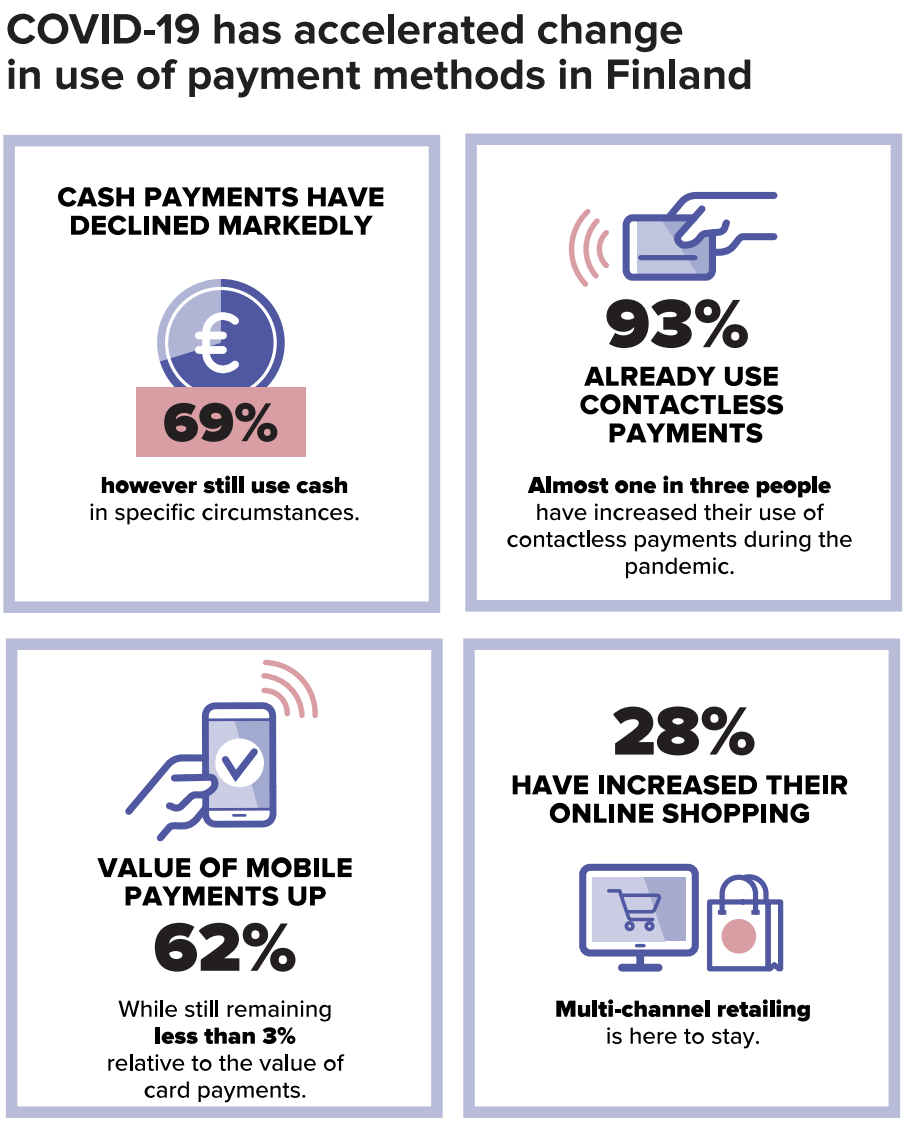


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The COVID-19 pandemic has accelerated changes in the use of payment methods in Finland. Nearly half of Finns have reduced their use of cash during the pandemic, and most believe that their use of cash has decreased permanently. Contactless and mobile payments as well as online shopping had already grown in popularity, but due to the COVID-19 pandemic people have begun to use them more widely. Nevertheless, even today cash remains an important means of payment for many people, and it still serves as a fall-back in the event of disruptions to electronic payments.


PAY

Chart 1.



Source: Bank of Finland

Year 2020 was in many ways exceptional, and it will remain such also in the history of payments. The COVID-19 pandemic that spread to Finland at the beginning of the year and the restrictive measures taken to prevent the spread of the virus have forced people to change their daily habits. This has also been strongly reflected in Finns' purchasing and payment behaviour. A reduction in private consumption and greater consideration of hygiene in payments have led to a significant

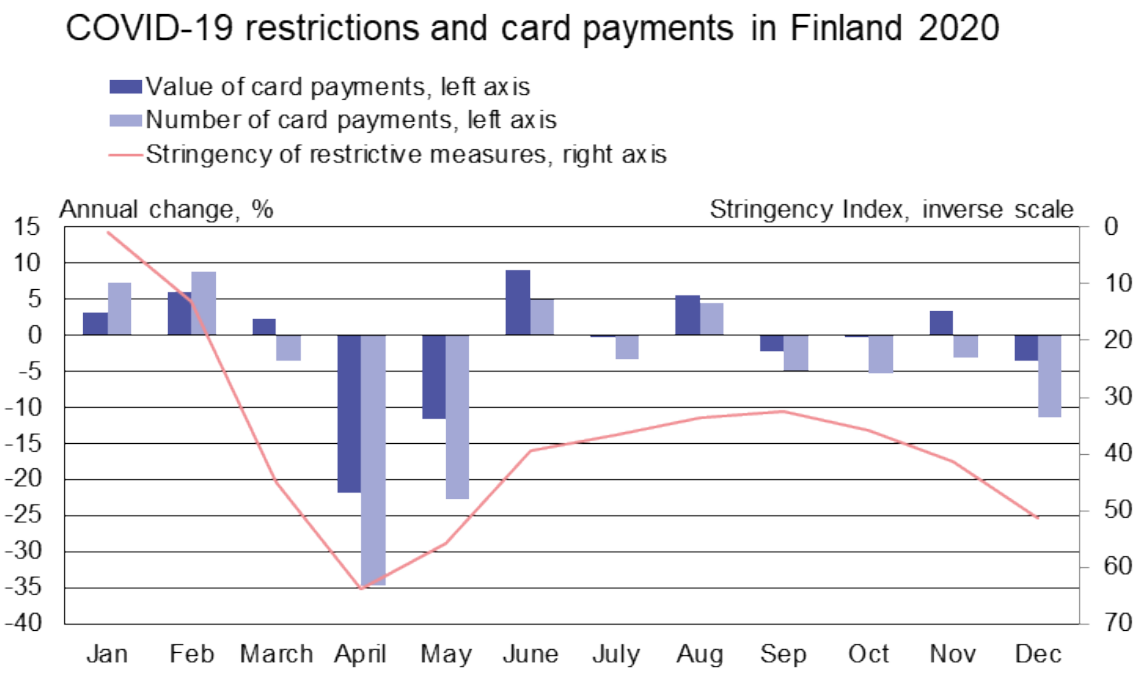
decline in the use of cash and an increase in the popularity of contactless and mobile payments. In addition, time spent at home has increased due to COVID-19, as a result of which many people who used to shop in brick-and-mortar stores have increasingly switched to purchasing products and services online. While some consumers might return to their old consumption and payment habits after the COVID-19 crisis, the prolonged duration of the pandemic increases the likelihood that the changes will become permanent.

How has the COVID-19 pandemic affected the use of cash and electronic payment methods? How will the pandemic affect Finns' purchasing and payment habits in the future, and will this have an impact on the payments market in Finland? This article seeks to answer these questions based on surveys of consumers and payment service providers. The surveys, conducted in early 2021, examined both consumers' and payment service providers' experiences of payments during the COVID-19 pandemic and particularly how the pandemic has affected their actions. In addition, this study utilises payments statistics collected annually by the Bank of Finland[1].

Developments in card payments reflect rapid changes in consumption habits

To assess changes in payment habits, it is first necessary to examine the developments in private consumption during the pandemic. According to data received from domestic banks, the consumption behaviour of Finns changed considerably in the early stage of the COVID-19 crisis[2]. Due to the rapidly increasing number of infections and tight restrictions, private consumption based on card payments contracted by more than 20% in April 2020 on the corresponding period a year earlier (Chart 2). After the sharp decline in the spring, card payments recovered fairly quickly and during the summer exceeded the previous year's level. Although the number of COVID-19 infections increased rapidly again towards the end of the year and restrictions were stepped up, this did not have the same effect on the total value of card payments as in the spring.

Chart 2.



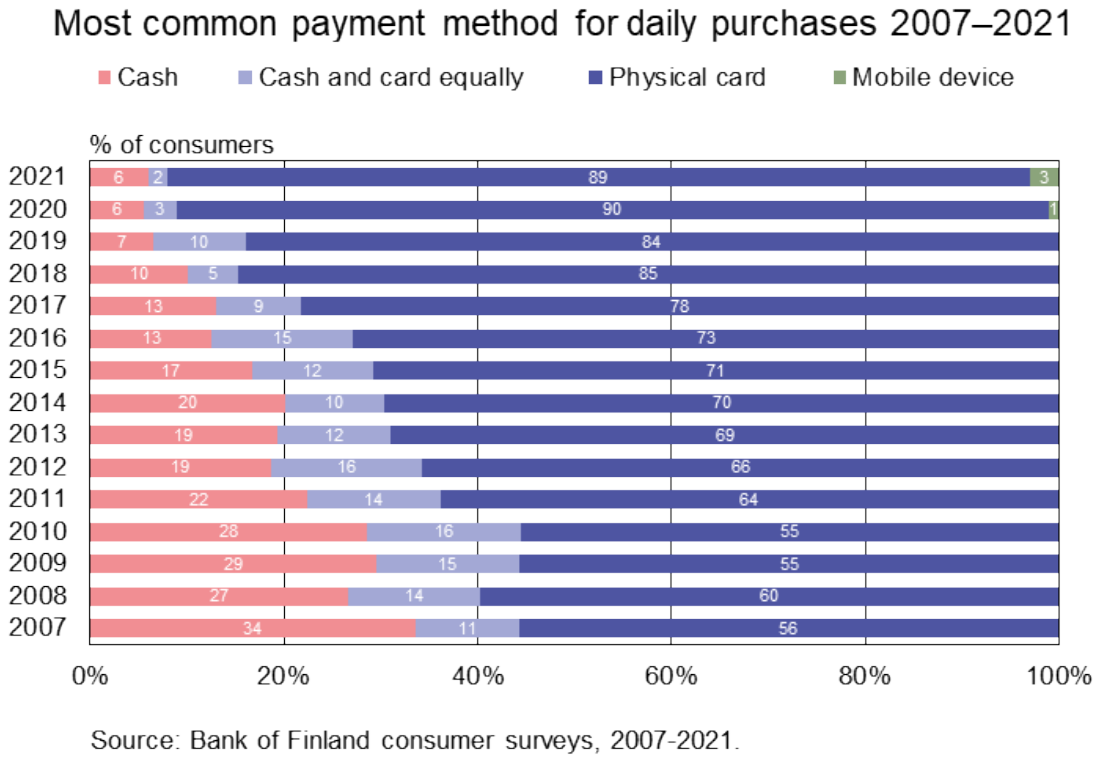
Sources: Bank of Finland and University of Oxford (Government Response Stringency Index).
*'Card payments' refers to payments made in Finland with cards issued in Finland.

Sectoral differences have, however, been substantial throughout the crisis, as people have been encouraged to restrict physical meetings and avoid unnecessary travel. Household consumption has been focused mainly on the retail sector, and particularly on consumer non-durables. In contrast, demand has contracted in many service sectors: accommodation and catering services, transport services, leisure and culture, for example, have suffered most from the crisis[3]. During the pandemic, people have visited stores less often and the amount of small purchases have declined, which has also been reflected in an increase in the value of average card purchases. Private consumption is expected to accelerate in 2021 as vaccination coverage increases, but in some sectors the effects of the crisis may be evident for a long time to come[4].

Due to the increasing use of payment cards, however, payments made with cards provide a rather more positive picture of recovery in consumption than is actually the case[5]. The value of card payments had already been growing steadily at an annual rate of around 5% long before the pandemic. In addition, many stores have recommended paying by card instead of cash to prevent the spread of COVID-19, which has further increased the popularity of card payments. For example, based on the Bank of Finland's consumer surveys[6], the proportion of Finns who favour cards in daily purchases has grown from 84% to 90% from 2019 to 2020 (Chart 3). However, in the

most recent survey in March 2021, this proportion seems to have decreased slightly, while the proportion using payment solutions on mobile devices (e.g. smartphone or watch) as the main payment method has increased from 1% to 3% between the last two surveys. This suggests that, as a result of the pandemic, the use of payment cards has shifted, at least in part, towards use of mobile payments as the primary means of payment (mobile payments are discussed in more detail later in this article). Card payments will probably remain the most common payment method for daily purchases for a long time to come, but new forms of electronic payments will challenge the position of the physical card in the future.

Chart 3.



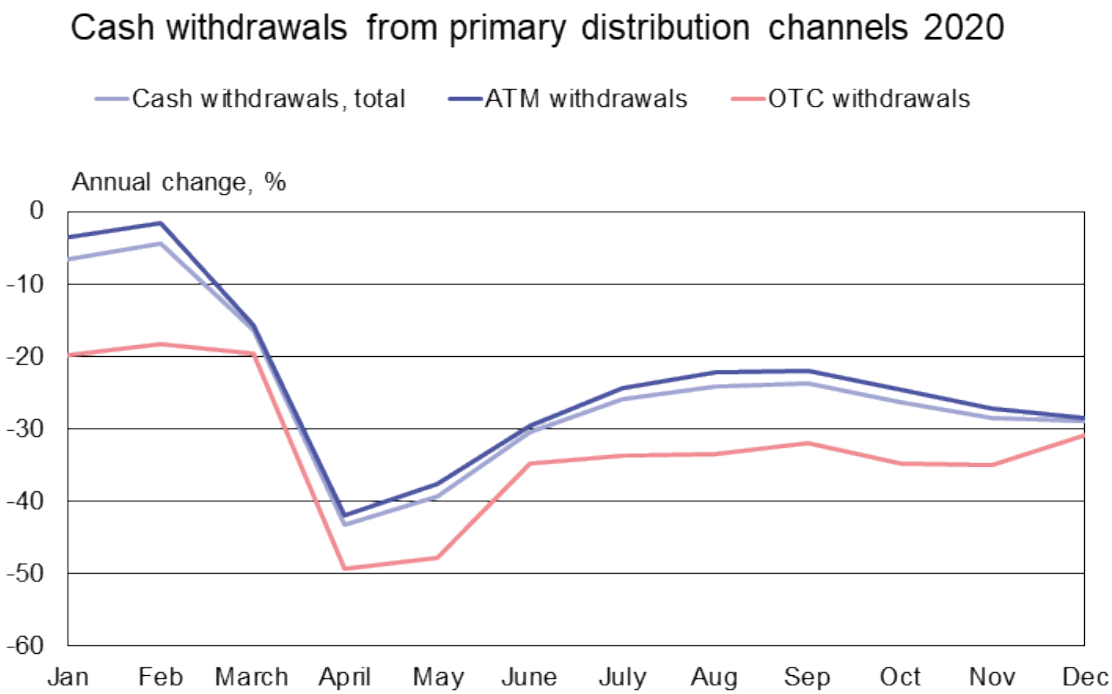
Source: Bank of Finland consumer surveys, 2007-2021.

Despite the decline in the use of cash, it remains an important means of payment

The contraction in private consumption and concern about the risk of COVID-19 infection also led in spring 2020 to a significant reduction in cash payments. Statistics on payments made with cash are not available in the same way as on card payments, but the development of cash withdrawals also reflects changes in the use of cash as a means of payment. The biggest reduction in cash withdrawals took place in April 2020 after the Emergency Powers Act entered into force in mid-

March; the total value of cash withdrawals fell by 40% on the corresponding period a year earlier (Chart 4). Unlike in many other countries, there was no major surge in cash withdrawals at the onset of the COVID-19 crisis[7]. The level of cash withdrawals began to recover in the summer as COVID-19 cases and restrictions eased, but in late 2020 the second wave of the pandemic cut short the upward trend in withdrawals. While total purchases made by card returned to approximately their former level after the summer, the total value of cash withdrawals at the end of the year was still almost 30% lower than a year earlier.

Chart 4.

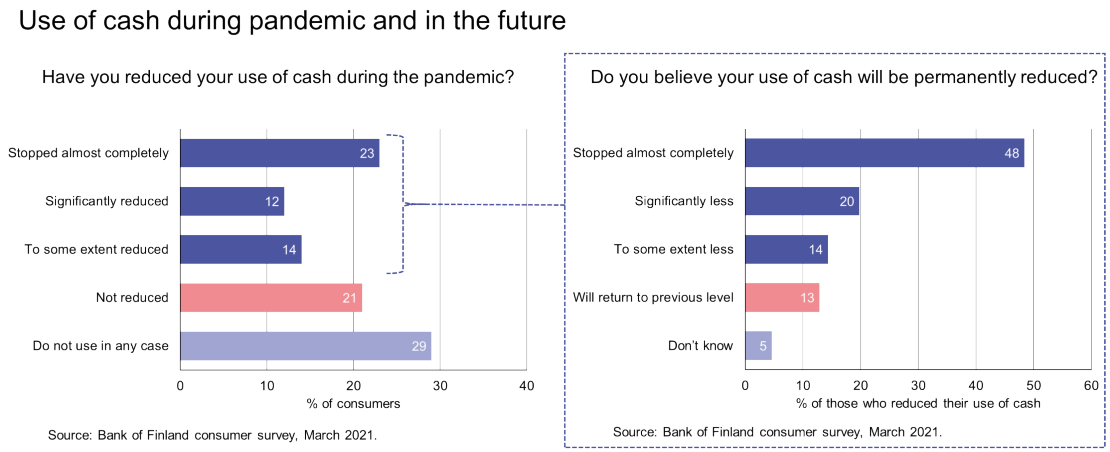


Source: Bank of Finland.

Examining the change over the whole of 2020, cash withdrawals from ATMs and bank branches decreased by a total of just over a quarter in euro terms. In Finland, the use of cash has decreased steadily over the past decade and the value of cash withdrawals was declining at an average annual rate of 6% before the pandemic. Use of cash as a means of payment would therefore appear to have decreased substantially as a result of the pandemic. As private consumption accelerates and restrictions are eased, use of cash is expected to recover, at least to some extent. However, the prolongation of the COVID-19 situation increases the likelihood that a significant part of the contraction in cash payments and the shift to the electronic payments will become permanent.

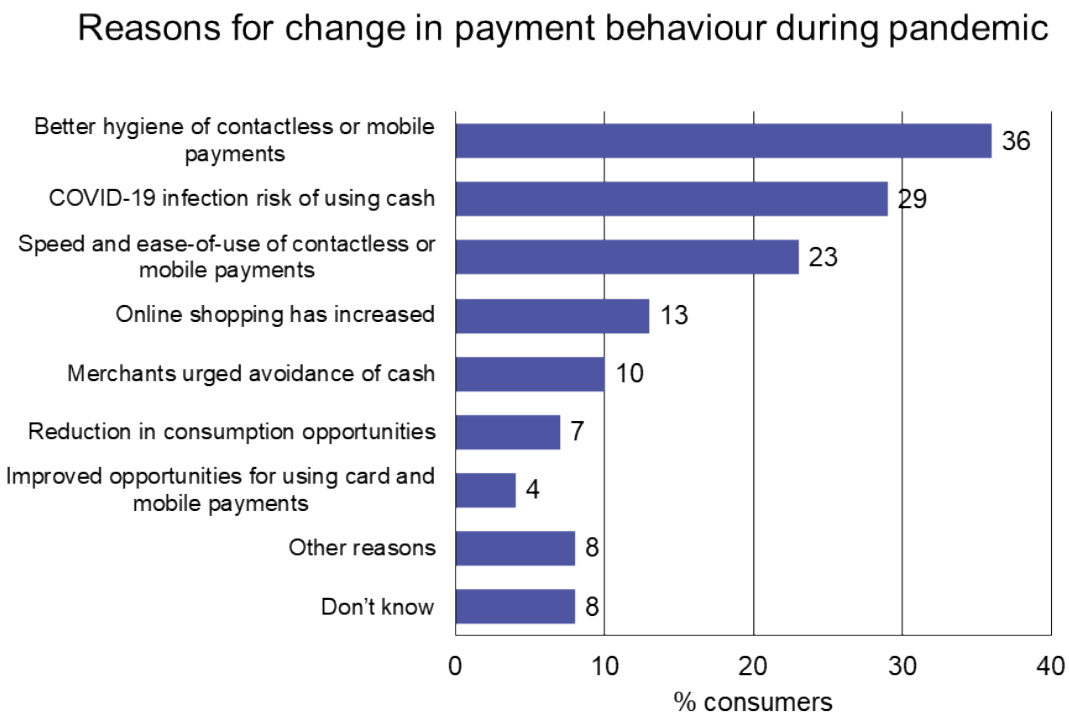
Nearly half of Finns have reduced their use of cash over the past year or have even stopped using cash almost completely (Chart 5). Of those who reduced their use of cash, only 13% believed they would return to paying with cash in the same way as before the pandemic. The main reason for the reduction in the use of cash has been concern about the COVID-19 infection risk associated with handling banknotes and coins (Chart 6). In addition, many merchants have urged customers to avoid the use of cash, and some have not accepted cash payments at all. A number of different studies show, however, that the actual COVID-19 infection risk from banknotes and coins is very low.[8] Although cash in itself is not a probable source of infection, the wish to avoid physical contacts has been a sufficient reason for many people to switch to using other payment or purchase methods.

Chart 5.



According to a study conducted by the European Central Bank, the pandemic has accelerated the digitalisation of payments also in countries where cash has traditionally had a strong position. The study found that 87% of people who had paid less with cash consider that they would continue to do so when the crisis is over[9]. Studies conducted in many other countries also suggest that COVID-19 will result in permanent changes in payment behaviour.[10] Although the pandemic has accelerated the shift from cash to card payments both in Finland and elsewhere in Europe, cash is still the most widely used payment method in many other euro area countries.

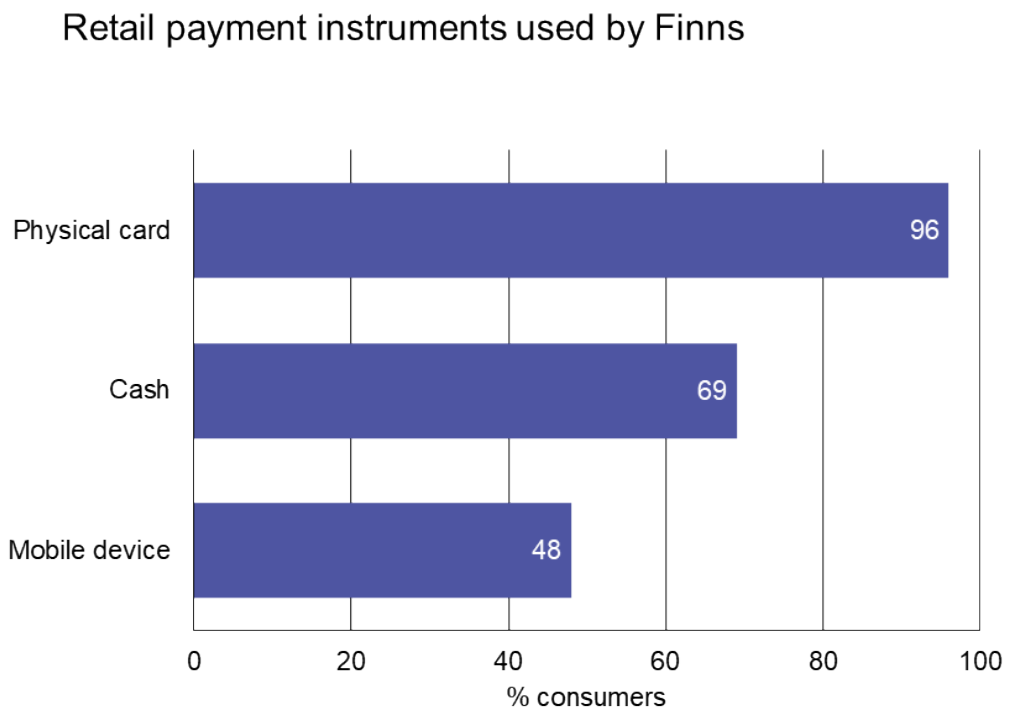
Chart 6.



Source: Bank of Finland consumer survey, March 2021.

Despite the decline in its use, cash remains an important means of payment for many Finns. According to the consumer survey conducted in March 2021, around 350,000 Finns use cash as their primary means of payment (Chart 3). In purchases of consumer non-durables, the proportion of consumers favouring cash has hardly changed, even during the pandemic. Instead, it is particularly consumers who previously used both cash and cards for payments who have reduced their use of cash. The proportion of such consumers has fallen from 10% to just 2% during the pandemic. Based on the survey, it therefore appears that this group has largely switched to using payment cards only for daily purchases.

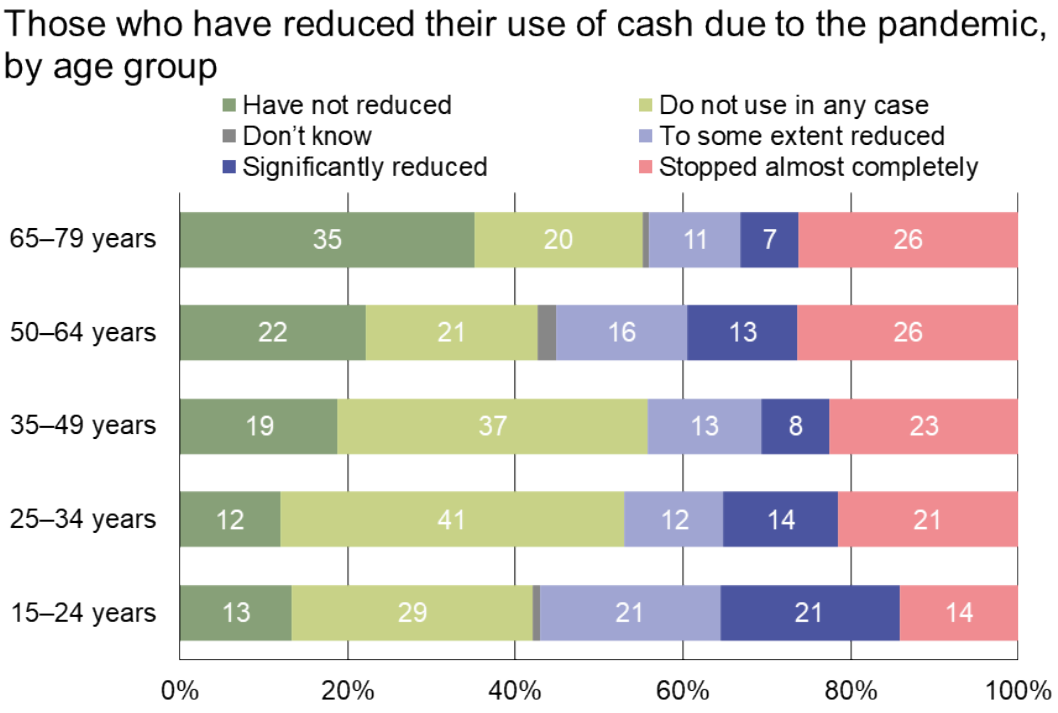
Chart 7.



Source: Bank of Finland consumer survey, March 2021.

Nearly 70% of Finns, however, still pay in cash in some situations (Chart 7). According to the consumer survey, cash is used mainly because it is not always possible to use an electronic payment method. In addition, nearly one in five consumers still use cash particularly when making small purchases. Use of cash is most common mainly in the oldest age groups, although it also declined most strongly among these age groups in 2020 (Chart 8). One reason for this may be that older people have been particularly affected by COVID-19 restrictions and recommendations. In addition, the risk of severe illness from the virus increases with age, which may have enhanced the change in payment behaviour among older people in particular[11].

Chart 8.



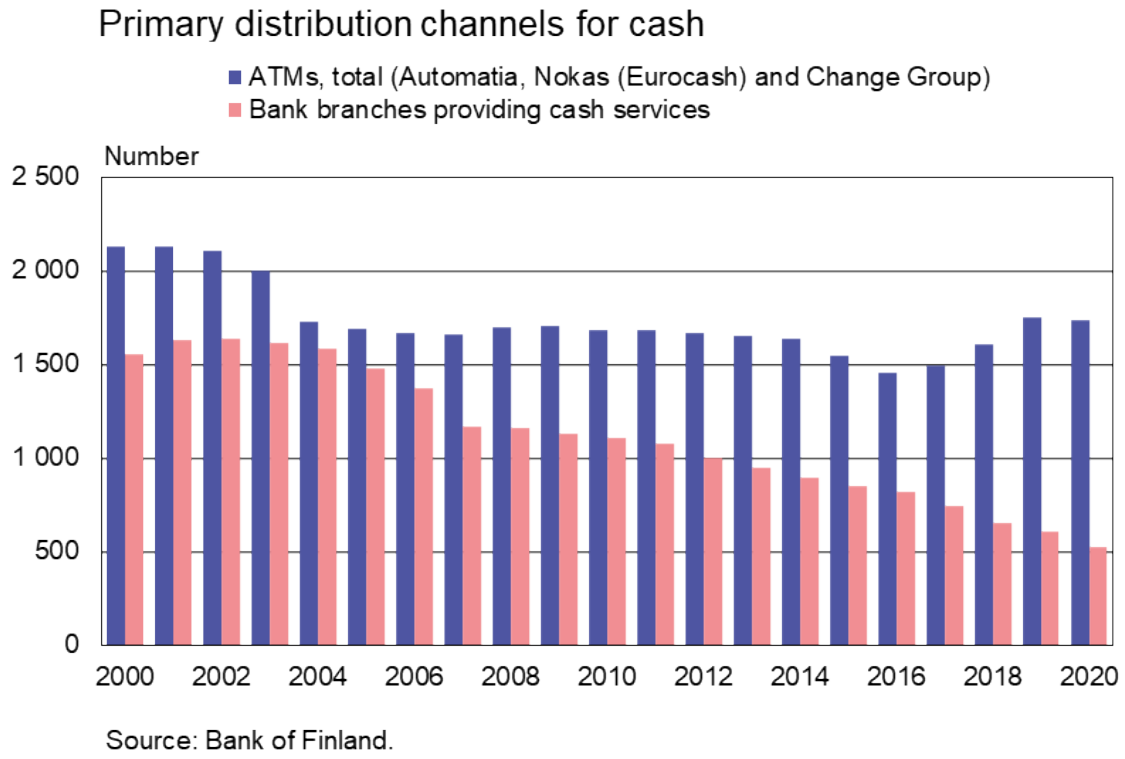
Source: Bank of Finland consumer survey, March 2021.

Cash has certain special features that other payment methods do not fully provide.[12] It is therefore important that cash is available and can be used as long as people need and want it.[13] If use of cash continues to decline, however, the costs to merchants and various cash supply actors in relation to its use may increase further. If maintaining a network for the availability and acceptance of cash does not continue to be a sufficiently profitable business activity, there is a risk that it will shrink and become too small. In that case, it may be impossible to restore the network in the event of a serious disruption to electronic payments. The change in payment habits accelerated by the COVID-19 pandemic may thus bring forward the possible need to secure the position of cash in the Euro area and in Finland through legislation. This may become of immediate concern should the availability and acceptance of cash deteriorate significantly and it is not possible to create other effective fall-back systems for payments from a national contingency perspective.

The number of bank branches providing cash services has long been in decline, and this trend also continued in 2020 (Chart 9). During the crisis, branches have also been temporarily closed or their opening hours reduced[14]. The number of ATMs, on the other hand, increased before the pandemic with the entry onto the market of a new operator, but their total number also decreased slightly

last year. Nevertheless, the availability of cash has diversified in recent years, and it is also possible to withdraw cash with most cards from over 3,200 retail outlets at checkout, as long as the retail outlet has sufficient cash available to enable this. In addition, over the past year, some banks have added the option of ordering cash by post. Most cash distribution still takes place, however, via ATMs and bank branches.[15] Although the primary distribution channels for cash decreased slightly during 2020, Finns consider that the availability of cash has remained good during the pandemic. In March 2021, nearly 90% of Finns remained satisfied with the availability of cash.

Chart 9.



Source: Bank of Finland.

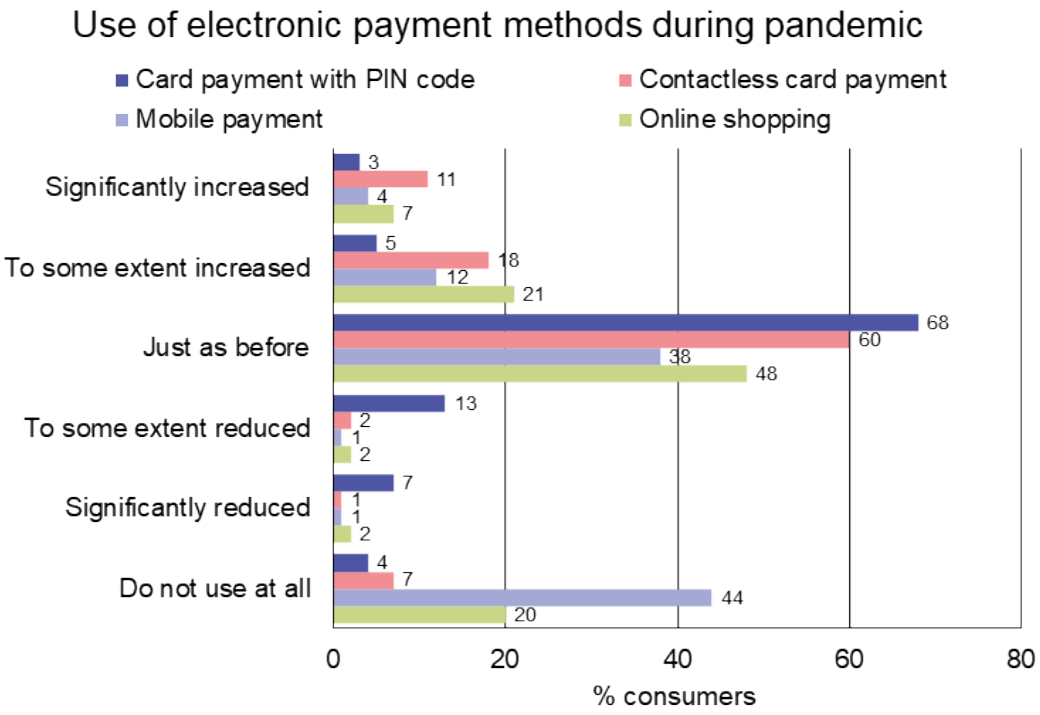
Pandemic further accelerated growth in contactless payments

As use of cash declines and card payments become more common the popularity of contactless payments has also grown due to the pandemic. Based on data received from banks, however, the proportion of contactless payments made with payment cards initially declined slightly in spring 2020 due to tight restrictions and an increase in the value of the average purchase. In the summer, the lifting of restrictions and a decline in infections returned contactless payments to a growth track. Although growth in the proportion of contactless payments slowed towards the end of the

year as the COVID-19 situation deteriorated again, nearly 60% of card payments were made as contactless payments in December 2020.[16] This was over 10% higher than a year earlier.

In addition, nearly one third of Finns has increased their use of contactless card payments during the COVID-19 pandemic (Chart 10). In this respect the pandemic has introduced the desire for hygiene as a new requirement for payments in addition to speed, ease-of-use and security (Chart 6). The change in payment behaviour related to COVID-19 is also reflected in the first-time use of the contactless payment feature of cards: for example, nearly 20% of consumers over 50 years of age had tried the feature for the first time in the past year (Chart 11). According to the consumer survey, as many as 93% of consumers had tried contactless payments by March 2021.

Chart 10.



Source: Bank of Finland consumer survey, March 2021.

Even before the start of the pandemic, Finland had adopted the EUR 50 maximum limit set by EU legislation, with the entering of a PIN code always required for larger amounts.[17] The upper limit for contactless payments was raised from EUR 25 to EUR 50 in April 2019, since when contactless payments have already increased sharply. In many other European countries, a corresponding increase was made only during the pandemic itself.[18] The COVID-19 pandemic has further accelerated the spread of contactless payments, but little room for growth remains within the

security limits permitted by current regulations. Contactless payment limits do not, however, apply to mobile payments, because these require the customer to unlock the device, for example with a password or fingerprint authentication, in order to pay. This meets the requirement for strong authentication, and therefore it is already possible with mobile payments to make purchases of more than EUR 50 at point of sale (POS) without having to enter a PIN code in the payment terminal.

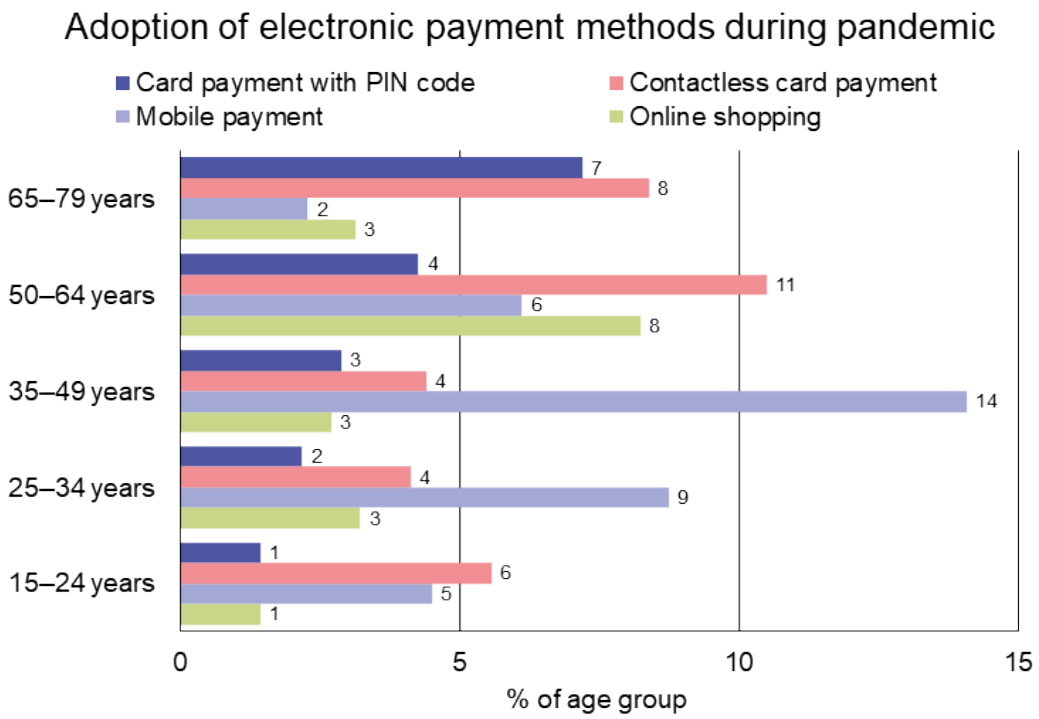
Growth in mobile payments still in its infancy

Greater consideration of hygiene and avoidance of physical contacts have also increased interest in mobile payments. Mobile payments usually refer to payment transactions initiated via a smartphone or other mobile device. To pay with a mobile device, one of the many mobile payment solutions available must be installed on the device.[19] The applications can be used to make contactless payments at POS, pay for online purchases or transfer money to another user. The amount of the payment transaction is usually debited from a payment card or directly from the user's own bank account.

According to payment service providers, there was a significant growth spike in the use of mobile payment solutions in the early stage of the COVID-19 crisis in spring 2020, when new users and a shift from other payment methods increased the popularity of mobile payments. Based on data received from banks, the total value of mobile payments increased by 62% from the previous year during the first year of the pandemic. Despite this strong growth, however, the proportion of mobile payments relative to the total value of card payments has remained small, at less than 3%. Thus, the growth in mobile payments is still in its infancy.

Nevertheless, according to the consumer survey, 48% of Finns already use mobile payments in some situations (Chart 7). Nearly one third of mobile payment users stated that they had increased their use of payment applications during the past year. Use of mobile payment services is most common among younger people, but, due to the COVID-19 pandemic, the average age of users would appear to have risen (Chart 11). Use of mobile payments has become more common in nearly all age groups and is largely dependent on how active the consumers are in general as users of mobile devices.

Chart 11.



Source: Bank of Finland consumer survey, March 2021.

With regard to the speed of adoption of mobile payments, the extent to which consumers switch to using them at POS and in online shopping will be decisive. According to data received from mobile payment service providers, mobile payments had already become more common before the pandemic, particularly due to person-to-person payments, but during the COVID-19 crisis, mobile payments have increased most in consumer-to-business payments. Among the most common payment methods, use of mobile payments for daily purchases is still modest, however (Chart 3). If an existing technology, such as card payments, has already been found to be good enough, consumers will not necessarily be willing to try new means of payment unless they bring some significant additional benefit. Mobile payments would appear to have gained a firmer foothold as a payment method in online stores.

The payments market in the EU remains highly fragmented, however. Many mobile payment solutions do not currently work across borders, for example. Indeed, one of the next natural steps is the interoperability of different mobile payment solutions at both a European and a national level. European actors have, in fact, already launched many cooperation projects aimed at harmonising electronic payments in Europe.[20] In addition to national solutions, there are currently already on the market many global payment solutions that can also be used abroad. In the payments sector generally, there has long been a trend towards internationalisation and

concentration, and it is possible that a similar trend will be seen in mobile payment services in the future.

Multi-channel consumption is here to stay

The COVID-19 pandemic has increased the time we spend at home, which has also led consumers to shop remotely more than before. Where, previously, products were rarely purchased online or only for a certain product group, online shopping has become more of an everyday occurrence, and the product range has expanded. Data from banks show that in 2020 the total value of e-commerce payment transactions grew by around one quarter from the previous year. Taking into consideration that in normal circumstances before the pandemic a significant proportion of online sales consisted of travel-related services, such as airline tickets or hotel reservations, the growth figure is significant.

Some 28% of Finns have increased their online shopping during the pandemic (Chart 10). Shopping online has increased among younger people, in particular, and seems to have become a part of everyday life, especially for the young. In the oldest age groups, products and services are still purchased quite rarely online, although many people over 50 years of age, in particular, have tried shopping online for the first time during the pandemic (Chart 11). Despite the proliferation of e-commerce, up to one fifth of consumer survey respondents had not yet made purchases online by March 2021.

What is vital for the growth of e-commerce is whether consumers who increased their online shopping during the pandemic will continue to do so or whether they will return to their former behaviour. Domestic banks and agents providing e-commerce payment services believe that the change will be to a large extent permanent. Ease and simplicity as well as a larger range of products and more competitive prices than in physical stores contribute to the popularity of shopping online. Many consumers have only just become familiar with digital shopping and may have found it to be an easy way to make purchases. In addition, the number of online merchants has increased sharply during the pandemic, as many traditional brick-and-mortar stores have transitioned to serving their customers online as well. With the pandemic, such multi-channel consumption has probably come to stay.

The growing popularity of digital shopping may also promote some negative side effects, however. For example, in online shopping, consumers are often offered flexible consumer credit or instalment agreements in connection with payment transactions. The real costs associated with these may later come as a surprise, which may contribute to increasing the risk of over-indebtedness. The overall picture of one's own indebtedness may also be blurred if debt has been taken from many different agents. The COVID-19 pandemic has also brought new customer

groups to online shopping, and first-time online shoppers, in particular, are at greater risk of falling victim to payment fraud. When shopping online, consumers should be aware as to whether the seller is reliable and delivery of the product is guaranteed[21]. There are also certain differences in the security of different e-commerce payment methods[22].

Overview of effects of COVID-19 pandemic on payments

The COVID-19 pandemic has compelled people worldwide to change their daily habits, which has also been strongly reflected in purchasing and payment behaviour. The effects of the pandemic have also been evident in the payment habits of Finns and have accelerated the digitalisation of payments. In Finland, electronic payment methods have been growing in popularity for a long time, but the COVID-19 situation has lowered the threshold for their wider adoption. Surveys conducted by the Bank of Finland for both payment service providers and consumers have revealed new findings on the effects of the pandemic on payments.

The use of cash as a means of payment has declined substantially during the pandemic, and it is expected that a significant part of the decline will be permanent. Cash remains an important means of payment for a significant number of people, however, and it also continues to play a key role as a fall-back in the event of disruptions to electronic payments. Ensuring the sufficient availability and acceptance of cash is therefore essential for the smooth operation of the economy and for equal participation in society. The change in payment habits accelerated by the COVID-19 pandemic may, however, bring forward the possible need to secure the position of cash in Finland through legislation, if the availability and acceptance of cash should weaken significantly.

The COVID-19 pandemic has also expanded the requirements for payments, namely the desire for hygiene in addition to speed, ease-of-use and security. This has particularly increased demand for contactless payment methods, such as contactless card payments and mobile payments. Use of mobile payments, in particular, has grown strongly during the pandemic, but relative to card payments the value of mobile payments is still modest. Time spent at home has increased during the pandemic, which has also led consumers to shop more online than before. Growth of mobile payments and online shopping is still in its infancy, however, and it is likely that their development and growth will only accelerate in the future.

Digital payment applications and solutions make payments easier and smoother, but at the same time make them less noticeable. As payments shift increasingly into the background of purchase transactions, the perception of one's own spending may become blurred. In addition, the growing popularity of digital shopping may also promote some negative side effects, such as the risks of over-indebtedness or payment fraud. Furthermore, the growing popularity of electronic payments

and the proliferation of online shopping further underline the importance of safety of payment solutions and the financial literacy required in a digital society.

The changes brought by the COVID-19 pandemic have been rapid and may have long-term effects. It will be some time, however, before we see which of the changes will ultimately be permanent and which will only be temporary. Nevertheless, the prolonged duration of the pandemic increases the likelihood that changes in payment habits will be permanent. Both market participants and the central banks, which oversee the market infrastructures, must be prepared for this.

Notes

1. Bank of Finland payments statistics: https://www.suomenpankki.fi/en/Statistics/payments-statistics/payments-statistics/ ↑
2. In February 2021, the Bank of Finland conducted a survey of banks that examined the effects of the pandemic on various payment methods and assessed the permanence of the effects. Nearly all of the domestic banks responded to the survey, so the responses provide a comprehensive picture of the change in private consumption and payment methods. ↑
3. See the reports of Finnish banks (in Finnish): Koskivuo, A. – Kostiainen, J. – Koivu, T. – Nummelin, K. (2021) Koronamittari: Ravintolat ahtaalla, March 2021, Nordea Koronamittari, https://corporate.nordea.com/api/research/attachment/129293 and OP Ekonomistit (2021) Talouden näkymät, February 2021, OP Ryhmän suhdanne-ennusteet ja talouskatsaukset, 21bd696a-ec4d-bbc9-298d-114f855b4746 (op.fi). ↑
4. See interim forecast for the Finnish economy, 'Growth will strengthen as the pandemic recedes', March 2021, Bank of Finland Bulletin, https://www.bofbulletin.fi/en/2021/articles/interim-forecast-growth-will-strengthen-as-the-pandemic-recedes/. ↑
5. According to Statistics Finland's sector accounts, household consumption expenditure at the end of 2020 was still about 5% lower than a year earlier. ↑
6. See the blog text (in Finnish) on how the use of cash has been avoided during covid-19 pandemic: Takala, K. (2021) Käteisen käyttöä vältelty koronapandemian aikana, April 2021, Euro & talous, https://www.eurojatalous.fi/fi/2021/artikkelit/kateisen-kayttoa-valtelty-koronapandemian-aikana/ and Ashworth, J. – Goodhart, C. (2020) Coronavirus panic fuels a surge in cash demand, July 2020, VOX (CEPR Policy Portal), https://voxeu.org/article/COVID-19-panic-fuels-surge-cash-demand. ↑
7. See: The Canadian Press (2020), WHO says currency doesn't transmit COVID-19 but retailers taking precautions, March 2020, National Global News, https://globalnews.ca/news/6712120/COVID-19-cash-precautions/ and Fabio Panetta (2020) Beyond monetary policy – protecting the continuity and safety of payments during the COVID-19 crisis, April 2020, European Central Bank, https://www.ecb.europa.eu/press/blog/date/2020/html/ecb.blog200428~328d7ca065.en.html. ↑
8. ECB (2020) Study on the payment attitudes of consumers in the euro area (SPACE), December 2020, European Central Bank, https://www.ecb.europa.eu/pub/pdf/other/ ↑

ecb.spacereport202012~bb2038bbb6.en.pdf?05ce2c97d994fbcf1c93213ca04347dd.

9. See: Jonker, N. – van der Cruijsen, C. – Bijlsma, M. – Bolt, W. (2020), Pandemic payment patterns, December 2020, De Nederlandsche Bank, DNB Working Paper, No. 701, https://www.dnb.nl/media/xbrj1xuc/working-paper-no-701.pdf, Ardizzi, G. – Nobili, A. – Rocco, G. (2020), A game changer in payment habits: evidence from daily data during a pandemic, December 2020, Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), No. 591, https://www.bancaditalia.it/pubblicazioni/qef/2020-0591/QEF_591_20.pdf?language_id=1 and Caswell, E. – Smith, M. – Learmonth, D. – Pearce, G (2020), Cash in the time of Covid, November 2020, Bank of England, Quarterly Bulletin, 2020 Q4, https://www.bankofengland.co.uk/quarterly-bulletin/2020/2020-q4/cash-in-the-time-of-covid. ↑
10. Eichenbaum, M. – Godinho de Matos, M. – Lima, F. – Rebelo, S. – Trabandt, M. (2020), How people respond to rare events, November 2020, VOX (CEPR Policy Portal), https://voxeu.org/article/how-people-respond-rare-events?fbclid=IwAR3KtDBQZ1rJLETv1NuhNhR8k7O8elNHlVrZtJbx648aujZhlhY9-rWzYzQ. ↑
11. Harju, A. – Snellman, H. (2021) The future of cash in Finland – a basic service secured by law?, November 2021, Bank of Finland Bulletin, https://www.bofbulletin.fi/en/2021/articles/the-future-of-cash-in-finland-a-basic-service-secured-by-law/. ↑
12. See: The Eurosystem cash strategy, European Central Bank, https://www.ecb.europa.eu/euro/cash_strategy/html/index.en.html. ↑
13. See: Survey of availability and pricing of basic banking services 2020, Financial Supervisory Authority, December 2020, https://www.finanssivalvonta.fi/en/Consumer-protection/banking-services/basic-banking-services/availability-of-basic-banking-services/. ↑
14. Bank of Finland payments statistics: https://www.suomenpankki.fi/en/Statistics/payments-statistics/payments-statistics/. ↑
15. These figures do not include mobile payments made at POS, which slightly reduces the share of contactless payments. ↑
16. Contactless payment limits are set out in Commission Regulation 2018/389, which restricts the value and number of contactless payment transactions that can be initiated without strong customer authentication. ↑
17. In Estonia, Latvia and Lithuania, for example, the contactless payment limit was raised to EUR 50 in March 2020 and in France and Slovakia in April 2020. ↑
18. In Finland, the mobile payment applications in general use include MobilePay, Pivo, Siirto, Apple Pay and Google Pay. ↑
19. As two examples of European retail payment harmonization projects, see the European payments initiative (EPI), http://www.epicompany.eu/ and the European Mobile Payment Systems Association (EMPSA), https://empsa.org/. ↑
20. See: Online shopping checklist, European Consumer Centre Finland, https://www.ecc.fi/en/themes/online-shopping/online-shopping-checklist/. ↑
21. See: Selecting a payment method, Finnish Competition and Consumer Authority, https://www.kkv.fi/en/facts-and-advice/payment-bills-debt-collection/methods-and- ↑

means-of-payment/.

Keywords

cash, contactless payment, COVID-19 pandemic, mobile payment, online shopping, payments