

# Swedish payments infrastructure priorities in a rapidly changing payment landscape

Tony Richards\*

Tony Richards is Senior Advisor at the Digital Finance Cooperative Research Centre, Sydney, Australia.

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The Riksbank asked me to come on-site for around eight weeks over April-June 2024 and to help them think about the future of payments in a rapidly changing landscape. The Riksbank was interested in an international perspective, based on my previous experience as Head of Payments Policy at the Reserve Bank of Australia and member of the Committee on Payments and Market Infrastructure of the Bank for International Settlements (BIS) over 2012-21, as well as my subsequent work on central bank digital currency (CBDC) issues at the Digital Finance Cooperative Research Centre. The brief was to look both at how existing payment methods (especially account-to-account payments) are changing but also at possible future payment methods (including both retail and wholesale CBDC), and to provide some thoughts on priorities for the Swedish authorities and the Swedish payments industry.

My conclusions and recommendations are shown in bold through the report and also summarised and repeated in the Conclusions section, which can be considered as an executive summary.

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## 1 Introduction

Payments are a particularly important element of a modern market economy – it may be only a modest exaggeration to describe them (as in a European Commission report) as the lifeblood of the economy (European Commission 2020). And payments are changing rapidly, with advances in technology enabling new methods of payment and greater functionality around payments, for example in terms of the ease of making payments, the tailoring of payments to different use contexts, the information that can accompany a payment, and so on. This is supporting the emergence of new

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\* This report on priorities for the Swedish payments system has been prepared for Sveriges Riksbank. The views in this report are mine, and not those of the Riksbank. I have had the opportunity to discuss my preliminary findings with staff from the Riksbank and some outside entities, but any remaining inaccuracies or factual errors are mine. The report was finalised in June 2024. I am very grateful to the Riksbank for this opportunity to work on a challenging assignment and to Riksbank staff for many excellent discussions and their hospitality. Thanks also to some outside entities which have helped inform my views, and to Jon Frost for providing data. The opinions expressed in this article are thus the sole responsibility of the author and should not be interpreted as reflecting the views of Sveriges Riksbank.

services and new business models in the economy. Developments in countries such as Brazil, India and Kenya highlight that payments can be a major catalyst for economic progress.

While it is true that the services provided by national payments systems are improving in many respects, the expectations of end users are becoming more demanding. So it may be important to periodically review the existing arrangements in national payments systems and how well they are meeting the needs of households, businesses and government entities that use the payments system.

Accordingly, this report reviews some aspects of the Swedish payments system, focusing on payments infrastructure and how to best meet the needs of end users.<sup>1</sup> In doing so, it looks at global trends and compares developments and arrangements in Sweden with those in other jurisdictions. Every country is unique, of course, and payments arrangements in other markets reflect their own institutions and history. Still, it may be possible to learn from international comparisons. The goal is to identify any gaps in the services currently available in Sweden and to suggest some possible directions/opportunities for the evolution of the Swedish payments system, including possible priorities for policymakers. In the interests of making this a manageable exercise, I do not attempt to address all issues, with little coverage of important issues such as preparedness, open banking, financial inclusion (for example, access to basic payment accounts and digital identity), government payments, and fraud and financial crime. And the focus is on electronic payments, with only brief coverage of the role of cash.

The report considers possible options for a range of different payment services and types. I have tended to put most of my focus on issues where outcomes are largely within the control of the Swedish authorities and payments industry, with relatively less focus on others where outcomes are more dependent on international developments. The latter group includes the area of cross-border payments, where there is a major international work program underway and Sweden has little choice but to implement the measures that have been agreed by global institutions such as the G20 and the Financial Stability Board. My view is that this group also includes developments regarding central bank digital currencies (CBDCs), since there is so much work underway internationally on both retail and wholesale CBDCs. Decisions as to whether to introduce retail or wholesale CBDC will certainly be decisions for the Swedish authorities, but they will be heavily informed by the work underway internationally. In my view, there are very good reasons for Sweden to be positioning itself so that it can be a ‘fast follower’ here, closely watching and (where possible) participating in international workstreams and learning from the insights (and mistakes) of others.

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<sup>1</sup> I use the term ‘payments system’ to refer to the whole range of payment instruments, arrangements and infrastructure that payment providers use to provide payment services to end users (that is, to households, businesses and government entities). Hence it includes a range of individual payment systems or services (such as the cash system, the cards systems, the Swish service, et cetera) and the various clearing and settlement services that support payments by end users.

The major recommendations of the report relate to two issues where outcomes will indeed be within the control of the Swedish authorities and payments industry. First, I suggest that enabling a wider range of instant (or real-time) account-to-account payments should be a high priority for banks and the payments industry, in addition to the work underway to modernise Swedish bulk/batch payments. Second, I make recommendations regarding industry governance, given that the roles and responsibilities of different entities are so important for decisions about infrastructure and for outcomes in a national payments system. I suggest that the Ministry of Finance, Riksbank and payments industry should consider changes to industry governance that allow for greater input for smaller banks, non-bank payment entities and independent directors. In addition, it would be worth considering if the public sector should be providing some more strategic direction on priorities in the payments system.

A full list of recommendations, with their rationales, is included in the Conclusions section, which can also be viewed as an executive summary.

## 2 The role of the Riksbank

The Riksbank's overall objective for the payments system is for payments in Sweden to be safe, efficient and accessible.

Under the *Instrument of Government*, the Riksbank's broad responsibilities include 'promoting a well-functioning payment system'. Furthermore, the *Riksbank Act* gives the Riksbank various powers related to the payments system:<sup>2</sup>

- Chapter 3 requires the Riksbank 'to contribute to the stability and efficiency of the financial system, which also includes the ability for the public to make payments'. It gives the Riksbank powers to provide infrastructure for the settlement of payments and to determine rules for accessing that infrastructure. It also requires the Riksbank to oversee settlement, payment and clearing systems and to monitor developments in the payment market. The recommendations in this report largely relate to the Riksbank's mandate under this Chapter.
- Chapter 4 provides the Riksbank with powers concerning the issuance and distribution of currency, and would also enable the Riksbank to issue digital money, with the consent of the Riksdag.
- Chapter 5 gives the Riksbank responsibility and powers for ensuring that the public can make payments in the event of crisis and war.

Of course, some other regulators or public entities also have responsibilities regarding payments and payment services including:

- The Financial Supervisory Authority (Finansinspektionen or FSA) is responsible for the supervision, regulation and licensing of banks and other

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<sup>2</sup> The Instrument of Government ('Regeringsformen'), 1974:152; The Sveriges Riksbank Act ('Riksbankslagen'), SFS 2022:1568.

entities providing payments services, including in regard to financial crime (anti-money laundering and countering the financing of terrorism, or AML/CFT) issues. It also has responsibility for some areas of consumer protection, not least in relation to fraud

- The National Debt Office (Riksgälden) is responsible for the central government's financial management, including its payments.<sup>3</sup>
- County administration boards (especially Länsstyrelsen i Dalarna) and the Swedish Post and Telecom Authority (PTS) have responsibilities in the area of financial inclusion and access to basic payment services, particularly in rural areas.
- The Competition Authority has responsibility for competition issues in the payments market.

In addition to its formal powers in the payments system as overseer and regulator, issuer of Sweden's currency and provider of critical settlements infrastructure, the Riksbank seeks to play a role as catalyst or coordinator among entities involved in the payments system. It convenes three advisory bodies. The Swedish Infrastructure Council for Payments and Securities (Infrastrukturrådet för betalningar och värdepapper) includes a group of entities providing or using the infrastructure for payments and securities. The Retail Payments Council (Betalningsrådet) consists of representatives of various providers of payments services, public sector agencies with mandates including payments, and representatives of the business and consumer sectors. And the Cash Handling Advisory Board (Kontanthanteringsrådet) includes representatives from banks, cash depot companies, security transport firms, merchants and relevant public authorities. While none of these are decision-making bodies, they enable the exchange of views on developments in the payments system and help the Riksbank to identify issues of concern.

Overall, given the Riksbank's existing roles in the Swedish payments system and its broader role in the financial market, my view is that the Riksbank would be well placed to contribute to a greater role for the public sector in influencing payments system developments along the lines of my recommendations in Section 4.

### 3 Some current issues in the Swedish payment system

This section discusses six different topics related to payments infrastructure, ranging from the legacy (cash) to the prospective (retail and wholesale CBDC). The discussion attempts to cover both the current situation and any gaps in the services that are currently being provided, drawing on international comparisons where relevant. The discussion of each issue concludes with some observation regarding possible priorities for the authorities (including the Riksbank) or private-sector providers of infrastructure and services.

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<sup>3</sup> The recently established Utbetalningsmyndigheten has responsibility for detecting and preventing incorrect social payments and payments from state authorities.

### **3.1 The shift to instant payments and the modernisation of domestic retail payment systems**

The environment for electronic payments is changing rapidly in Sweden, as it is elsewhere. The services provided to end users of the payments system are improving and equally the expectations of end users are becoming more demanding. In line with the shift towards an 'instant society', an increasing share of payments are occurring in real-time, with recipients able to access their funds immediately, and on a 24/7/365 basis. There is also an expectation of greater functionality around payments, for example in terms of the ease of making payments, the tailoring of payments to different use contexts, the information that can accompany a payment, and so on. Improved payments services are frequently being provided by new, non-traditional players in the payments system. Also, the regulatory framework is changing, with new regulations and directives coming from the European Union, including on consumer protection and increased competition. And there has been a significant uplift in a key part of the domestic payments infrastructure, with the launch of the Riksbank's RIX-INST service, which uses the European Central Bank's TIPS infrastructure and enables the instant settlement of payments from Swish and potentially other types of payments.

Against this background, this section compares the modernisation of retail payments in Sweden and elsewhere, focusing in particular on the provision of instant payments, and suggests some directions for the possible evolution of the Swedish retail payments infrastructure. The focus is on conventional account-to-account payments, rather than card-based payments.

#### **3.1.1 Instant payments in Sweden**

The growth of payments through the Swish service is a leading example of how the population can rapidly adopt instant payments. When Swish was launched in 2012, it was initially to enable P2P payments, primarily displacing cash transfers, but also making bank transfers between individuals easier and faster.<sup>4</sup> In subsequent years, P2B and then P2G payments were also introduced. The Swish branding, simple-to-use app and strong support from the major banks were key elements in the growth of Swish, as witnessed by the emergence of a new verb – 'att swisha' or 'to swish'. Swish now accounts for around 45 per cent of all credit transfer (or push) payments (by number) in Sweden or around 37 per cent of all bank payments (including debit, or pull, payments).

This shift towards instant payments has become a global trend, with the Bank for International Settlements recently noting that households and businesses in over 100 jurisdictions now have access to fast payments, with more systems to be launched in the coming years (Frost et al. 2024). Table 1 provides information on some important

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<sup>4</sup> P2P is person-to-person; B denotes business and G denotes government.

aspects of instant payments services or systems, comparing instant payments via Swish with trends in instant payments in other markets.<sup>5</sup>

**Table 1. Instant payments in Sweden and in other countries**

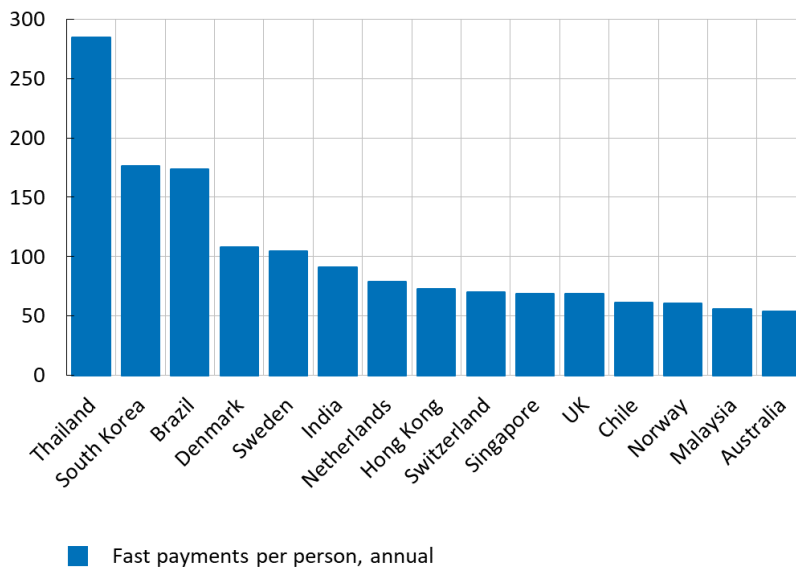
	Swish	Instant payments in other countries
<b>User experience</b>		
Payment types	Initial use was P2P but has broadened over time. Now includes some P2B, B2P, P2G and B2G for particular use cases (e.g., in-store and online commerce; request to pay; tax payments; payouts such as insurance, lottery, cost recovery)	Some systems have been designed from the start to take payments between all types of payers and payees (households, businesses and government entities)— i.e., they are not predominantly P2P but ‘all-2-all’
How are payments initiated?	Swish proprietary interfaces such as the Swish app. Payment info in the Swish interface can be obtained via QR code or request to pay	Initiation is typically not via a single branded service but via the payer’s bank’s mobile app or website and is accessible either from a smartphone or from internet banking
How are payments addressed?	Swish aliases; a phone number for private persons or a special number for corporations such as 123-number (obtained via QR or request to pay)	Typically both via aliases (e.g., mobile numbers, email address, business numbers or QR codes) which are linked to a bank account, as well as directly to bank account numbers
Customer verification	Use of BankID is required, as with other interactions with the customer’s bank	Typically the same verification method (e.g., biometrics or passcodes) used for all other interactions the customer has with their bank
Can payments be initiated via open banking?	No	Typically yes, if it is possible for regular credit transfers
Services in addition to basic credit transfer or ‘push’ payment	Request to pay, dynamic and static QR	Often request to pay, bill payment, QR codes, sometimes cash withdrawal from merchant
<b>Background arrangements</b>		
Settlement	Settlement takes place in real time in the central bank settlement system for instant payments (RIX-INST); until February 2024 settlement was in commercial bank money backed by central bank reserves	Often real-time and in central bank accounts, though some systems use delayed net settlement
Messaging standard	ISO20022	Generally ISO20022
Participation requirements	Credit institutions which are direct or indirect participants in RIX-INST	Typically all banks/financial institutions are eligible for participation, with some systems also providing paths for indirect participation by smaller institutions or non-bank payment providers
Ownership/governance	GetSwish is owned and governed by a consortium of 6 banks; there is no role for the broader payments industry or the public sector in its governance	Systems are often led by the central bank or developed jointly with the national payments association or payments scheme (e.g., Brazil’s Pix system, the US FedNow system and Australia’s NPP).

<sup>5</sup> The information on other markets is taken from a range of national sources and from the report on ‘Developments in retail fast payments and implications for RTGS systems’ (Committee on Payments and Market Infrastructure 2021).

While the adoption of Swish has been impressive, when one looks internationally it is noteworthy that some of the more recently introduced instant payment systems have seen even stronger adoption than Swish (Figure 1, and Figure 2 below). For example, the systems in two of the countries with the highest adoption of instant payments were introduced well after Swish; the Thai PromptPay and Brazilian Pix systems began operation in 2016 and 2020, respectively, versus 2012 for Swish.

**Figure 1. Instant payments per capita in 2023**

Selected economies with strong adoption of instant payments



Sources: ‘2023 Prime time for real-time’, ACI Worldwide and GlobalData, March 2024; World Bank Population Data; and national sources.

There may be a number of reasons why instant payments are being adopted more quickly in some other jurisdictions.

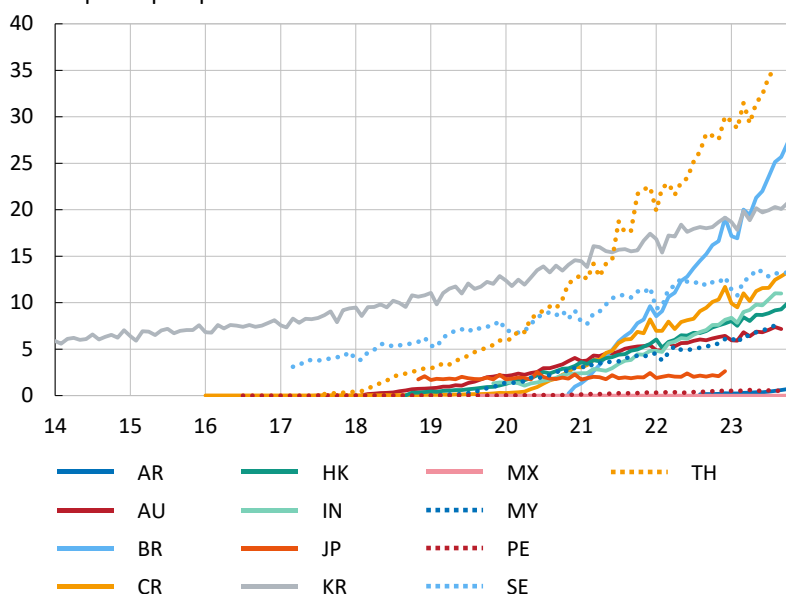
One noteworthy difference with some other systems is that Swish began as an app for households, whereas many other instant payment systems were designed for payments between all types of end users (households, businesses and government entities). And while Swish is a mobile phone-based app, many other instant payment systems are more interface-agnostic, including the ability to initiate instant account-to-account payments from within banks’ own apps or via internet banking. Accordingly, the instant payment systems in many other countries can be thought of more as a faster set of payment rails that banks can use to send all types of customers’ account-to-account payments, as opposed to being a particular (‘walled garden’) service.

Indeed, the four countries shown in Figure 1 with higher instant payments adoption (Brazil, Denmark, South Korea and Thailand) all provide for instant payments in standard internet account-to-account bank transfers, as well as mobile-based P2P transfers.

A related significant difference between Sweden and some other markets is that instant payments in many other markets have been made available to a much wider range of use cases. A recent BIS study defined seven broad ‘use cases’ for instant payment systems – P2P payments, payments to merchants, bill payments, cross-border payments, scheduling future payments, bulk payments and request-to-pay functionality (Frost et al. 2024). The study found that Sweden had the lowest number of such use cases in 2023 among the group of 13 countries studied and shown in Figure 2. Sweden also stood out as one of only two countries in the BIS study where non-bank financial institutions were unable to participate in the instant payment system. The study found that these two factors – the number of use cases and non-bank participation – were associated with higher adoption of instant payments in these 13 countries.

**Figure 2. Instant Payments Adoption in Selected Markets**

Transactions per capita per month



Source: Frost et al. (2024).

Accordingly, comparisons of instant payment systems suggest there are some aspects where the implementation of instant payments in Sweden is now behind what might be viewed as the leading practice internationally. Indeed, it may be worth noting the European Union (EU) has introduced an Instant Payments Regulation (IPR), which envisages that instant payments should be the default for all account-to-account payments in euro; the IPR does not, however, apply to payments in kronor or other non-euro currencies.

The concern in the EU has been that the European Central Bank (ECB) has been providing a settlement service for instant payments since 2018, but the payments market has been slow in the actual provision of instant payments to end users. Accordingly, the EU has chosen to regulate that banks providing regular (slow)



account-to-account payments services must also provide their customers with instant payments, and at no higher cost.

The situation is somewhat different in Sweden, with Swish being generally available and heavily used for some types of instant payments. However, as discussed above, instant payments are not available for all types of account-to-account payments ('all-to-all'), nor are they available for initiation outside of the Swish service, for example for open banking actors wanting to provide instant payment services.

For the time being, there is no indication that the Swedish authorities intend to implement a version of the IPR for domestic kronor payments. However, the Riksbank's RIX-INST service is now available for the instant settlement of individual payments, and its terms and conditions will require participants to adhere to the Nordic Payments Council's Instant Credit Transfer Scheme (NCT Inst) scheme from November 2024.<sup>6</sup> This means that RIX-INST participants (which includes all participants in the Swish service) must be able to receive and post instant payments from November 2024. Furthermore, the Riksbank has indicated that it also expects banks to provide their customers with the ability to send instant payments via RIX-INST (outside of the Swish ecosystem): 'The Riksbank's expectation is that shortly after November 2024, RIX-INST participants will start offering new payment products to their customers on RIX-INST based on the NCT Inst framework.'<sup>7</sup>

### 3.1.2 Bulk payments in Sweden

While payments via Swish account for a growing share of account-to-account payments, the majority of bank payments still use the legacy Bankgirot-operated clearing rails. This includes account-to-account credit transfers through the Dataclearingen system and payments through the Bankgirot system for credit transfers and giro payments from services such as E-faktura electronic invoicing, the Leverantörsbetalningar invoice system and the Autogiro direct debit system. The Bankgirot rails are all still batch-based and operate only on business days when RIX-RTGS (the Riksbank's main settlement service) is open for settlement, so that funds may only be available to the recipient hours (if not days) after the initiation of the payment, as opposed to available immediately. Payments through these different systems currently use proprietary messaging formats that may allow for straight-through processing but are not ISO20022 compliant and are limited (to varying extents) in the amount of data that can accompany the payment message.<sup>8</sup>

The large banks have been working towards a refresh of the Swedish bulk payments infrastructure since 2017. This has reflected a desire to update and simplify the legacy Bankgirot services and processes to be more efficient and innovation-friendly, with a

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<sup>6</sup> NCT Inst is the Nordic Payment Council's Instant Credit Transfer Scheme, which is a set of rules, practices and standards to achieve interoperability for credit transfer messages between banks and payment institutions.

<sup>7</sup> See [How payments work | Sveriges Riksbank](#).

<sup>8</sup> ISO20022 is a data-rich structured message format that has become the international standard for domestic and cross-border payments and has been adopted by the Nordic Payments Council (NPC) for its message standards (which are largely consistent with the standards adopted by the European Payments Council).

reduction in the number of clearing services. It has also been intended that there would be a shift to ISO20022 messaging. More recently, there has also been a focus on bolstering the resilience of Sweden's bulk payments infrastructure.

Importantly, the modernisation is also required for compliance with the EU's revised Wire Transfer Regulation regarding measures to fight money laundering and financing of terrorism. Indeed, in June 2024, Finansinspektionen issued a media release drawing attention to deficiencies in Bankgirot's systems which mean that its participating banks cannot meet the requirements in the anti-money laundering regulations on the transfer of information.<sup>9</sup> Finansinspektionen noted that it had been monitoring plans to remedy this problem for some time but was now requiring Bankgirot's three Swedish owners (Handelsbanken, SEB and Swedbank) to rectify deficiencies in Bankgirot's infrastructure by no later than December 2026. Finansinspektionen noted it had also contacted the supervisory authorities in Denmark and Finland and informed them of the need to take corresponding measures for Bankgirot's other owner banks.

The modernisation work began with Framtidens betalningsinfrastruktur (FBI) project involving the Swedish Bankers' Association (SBA) and seven large banks. Since 2020 this work has been occurring within the Transformationsprogrammet, involving P27, Bankgirot, the SBA and seven banks, and is being run by Bankinfrastruktur i Sverige AB (BSAB), a subsidiary of the SBA. There is little to show from the work to date, reflecting the diversion of the industry's focus over 2018-23 towards the planned P27 Nordic payments infrastructure.<sup>10</sup> Following the collapse of P27's broader plans for Nordic payments, it was announced in September 2023 that Bankgirot would continue to be responsible for maintaining and transforming the Swedish payment infrastructure. As of June 2024, it appeared that Bankgirot was close to announcing plans for a new SEK Batch clearing system, which could be implemented from 2026. This would take over the Dataclearingen flows and would have hourly batches through the business day and be consistent with the new ISO20022-based Nordic Payments Council Credit Transfer Scheme.

### 3.1.3 Conclusions on the modernisation of domestic retail payment systems

Based on the discussion above, I consider that there are some important priorities for the Swedish payments industry in both bulk/batch payments and instant payments.

**First, as a result of all the focus over 2018-23 on the ill-fated P27 pan-Nordic project, the Swedish payments industry – Bankgirot, the Bankers Association and the major banks – finds itself with a significant 'tech debt' or 'payments infrastructure debt'. There is a large body of work to be done to modernise the Swedish bulk/batch payment services, make them compliant with financial crime regulations and ensure their robustness in an environment of greater concern over resilience. This will be a**

<sup>9</sup> See Financial Supervisory Authority (Finansinspektionen) (2024).

<sup>10</sup> The original P27 plan was to streamline the Nordic commercial payments infrastructure by creating a pan Nordic clearing/settlement system (SEK, DKK, NOK, EUR), replacing the Betalningar i realtid (BiR) settlement system for Swish, moving from several national payment schemes to one, and moving from several payment scheme administrative organisations to one.

**multi-year project and the industry should be as transparent as possible with the authorities and end users of the payments system as this transformation is planned and implemented.**<sup>11</sup> Indeed, the experience since the Framtidens

betalningsinfrastruktur project was begun in 2017 must raise some questions about payments industry governance, a topic which I address in Section 4 of this report.

Second, as discussed above, a comparison with other countries suggests there are some aspects where the implementation of instant payments in Sweden is now behind what might be viewed as the leading practice internationally. There would seem to be a few directions in which instant payments in Sweden could usefully evolve. In particular:

- **Banks should take advantage of the new RIX-INST settlement system to allow instant payments for all types of customer accounts – households, businesses and government entities – both sending and receiving, that is, truly ‘all-to-all’ instant payments.** This would go beyond the current Swish service, which is still largely focused on household payments. And it is noteworthy that ‘all-to-all’ instant payments could help with the domestic leg of both inbound and outbound cross-border payments (including via digital money transfer operators), helping Sweden to meet the targets set by the G20, which are discussed below.
- **Banks should provide instant payments via a range of interfaces, and not just through the current Swish interfaces.** This would facilitate greater use of instant payments and more competition in payment services, including via open banking, in ways that are not feasible in the current Swish service.

Starting from November 2024, when the new requirements commence for all banks participating in RIX-INST, banks will be able to provide their customers with instant payments by simply sending individual payment instructions to the Riksbank.

However, **to fully reap the benefits of instant payments, it would be desirable to have some form of clearing infrastructure that provides useful functionality around these payments.**

**For example, before the settlement requests are submitted to the Riksbank, it could be useful to have some form of confirmation-of-payee service.** Such services are becoming common internationally and can be initiated either by a message sent to the payee institution or a message sent to a shared addressing or alias database.<sup>12</sup> A new alias or addressing service that allows for a wider range of aliases (mobile phone

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<sup>11</sup> It is likely that the shift to instant payments will continue in Sweden, especially if banks begin to provide new services to their customers through RIX-INST from November 2024. This may prompt the question of whether a batch-only system would be needed in the long run, but this would appear to be a question for the distant future in Sweden. One obvious benefit to maintaining separate systems is in helping with payments system resilience. I am only aware of one country that has taken the decision to migrate entirely to their instant payments platform – the payments industry in Australia has recently taken a decision to close the old batch Bulk Entry Clearing System and migrate all payments to its instant payment system (the New Payments Platform) with a target date of 2030, thereby avoiding the expense of modernising the batch system, including a shift to ISO20022 et cetera.

<sup>12</sup> The Nordic Payments Council has introduced a Confirmation of Payee Scheme, which is a set of rules, practices and standards to achieve interoperability in requests for confirmation of account details before a payment is made.

numbers, email addresses, business names or numbers, et cetera) would allow for easier addressing of payments, while a confirmation-of-payee service could also help with certain types of fraud.

**In addition, some form of centralised fraud analytics could be desirable.** Instant payment systems in some other jurisdictions are implementing functionality in their central clearing hubs that analyse (including with artificial intelligence) all the payments going through their systems to look for payments that have a heightened possibility of fraud. A centralised service that sees all the flows going through a system can be much more effective at looking for unusual payment patterns (for example, possible ‘mule account’ payments) than an arrangement where banks have only the information in their own payment flows. Such analysis can be done in a way that does not involve the sharing of personal information of end users.

It would be desirable for the banks and the broader industry to decide itself to move towards greater provision of instant payments. However, given the expectation that the Riksbank has already provided regarding banks providing new payments products, it would be open to the Swedish authorities to convey a view that they may at some point require something similar to the EU’s Instant Payments Regulation for payments in kronor, if Swedish payments providers are not making sufficient progress towards making instant account-to-account payments more generally available.

My suggestion that the industry should enable instant payments for all types of account-to-account payments will no doubt raise questions from banks and some other stakeholders.

Some stakeholders may suggest there is little need for the industry to provide broader and improved instant payments because (they may argue) there is, and will continue to be, little demand by corporates and government entities for instant payments beyond what is being met by Swish. Or they may argue that moving to hourly batches in the bulk payment services should be adequate for the needs of most end users.

However, this seems a hard argument to make, given what is being seen internationally and the demand for immediacy and improved services in so many other aspects of the lives and businesses of end-users.<sup>13</sup> Certainly it is true that not all business and government payments need to be real-time, but there are presumably many existing business/government payments that would already benefit from moving to real-time and surely many new business models that could emerge with more available real-time payments.

Of course, this may raise the question of if, and how, the payments industry might charge for instant payments. But that is a separate issue, which presumably could be

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<sup>13</sup> It is noteworthy that some new payment service providers (PSPs) in Sweden are using innovative methods to meet the demand for instant account-to-account payments. These typically take advantage of the fact that transfers between customers of the same bank are typically posted to the recipient immediately. By opening accounts at all the large Swedish banks, a PSP is able to receive a payment instantly from a customer at one bank and immediately pay out those funds to another customer using the PSP’s account at a different bank. It hardly needs to be said that this is a very inefficient workaround to provide a service that is now commonplace in many other jurisdictions.

resolved in different ways. Given the context of the provision of instant payments in the euro area, the European Union has chosen to regulate that the pricing of real-time euro payments cannot exceed the pricing of other slower payments. However, there would be no requirement for this to be adopted in Sweden for payments in kronor, and there are many markets (including Denmark and Norway) where the pricing of instant versus other payments has been left to the market.

Similarly, the greater risk of payments fraud in real-time payments may be raised as an argument against moving further towards greater provision of instant payments. However, as discussed above, there are steps that the industry can take to reduce fraud around instant payments. Introducing functionality for better addressing and for centralised fraud monitoring could help reduce fraud and indeed could be made available for use in other payment systems or services. There is also the option of using business rules to slow down certain types of payments if they are considered to have a greater risk of being fraudulent. And in the event that something similar to the EU's Instant Payments Regulation (which requires the delivery of payments in euro within 10 seconds) was implemented in Sweden, it would be open to the Swedish authorities to allow exceptions in the case of suspected fraud or to set a speed requirement in other ways.

### 3.2 Improving cross-border payments

Cross-border payments have long been recognised, both in Sweden and internationally, as subject to many problems, particularly in terms of being significantly slower and more expensive than domestic payments.

A 2020 report from the Financial Stability Board identified 19 workstreams – or 'building blocks' – that could help to improve cross-border payments globally, either by addressing obstacles in existing systems or by using new instruments or infrastructure to deliver improved cross-border payment services. The G20 subsequently adopted this report and set some ambitious targets – in terms of the cost, speed, access and transparency of cross-border payments – for improving cross-border payments and a major international work program is now underway to implement the G20's Roadmap (Financial Stability Board 2020, 2023).

There are a wide range of initiatives around the Roadmap that the Riksbank and the Swedish payments industry are expected to consider and/or deliver.<sup>14</sup> For presentational purposes, it may be useful to divide them into three categories:

- Measures to improve the way that cross-border payments are currently being made, most often using correspondent banking arrangements
- Initiatives to use recently implemented new infrastructure to improve cross-border payments
- Consideration of the use of possible future payment instruments (most notably CBDCs) to improve cross-border payments.

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<sup>14</sup> For further details on the Riksbank's work in this area, see Engström and Reslow (2022) and Claussen and Mølgaard Pedersen (2022).

The remainder of this section provides an assessment of the priorities for the Swedish payments industry.

The first group includes a wide range of measures or reforms that are often quite technical in nature, for example:

- Adopting harmonised ISO20022 messaging formats to allow more information to accompany payments across borders, for example to help with financial crime screening and to reduce the number of errors in payments and the need for intervention.
- Changes to central banks' settlement systems to allow both longer operating hours (to increase overlap with other markets) and access to central bank accounts for a wider range of entities, including non-bank payment service providers active in cross-border payments.
- Promoting API harmonisation in cross-border payments.
- Removing any unnecessary frictions in the implementation of AML/CTF rules.

Each of these measures offers the prospect of speeding up particular types of cross-border payments, both large and small. It should be noted that the initiatives are typically ones that will also yield benefits for purely domestic payments, or indeed are measures that are already underway for that reason. The Riksbank and other relevant Swedish authorities will have to continue to work with the domestic payments industry to ensure that relevant global initiatives are implemented on schedule in Sweden.

The most promising initiative of the second type is the possibility of linking instant payment systems. Work in this area has been most active in the Asian region, where a number of bilateral links have already been established between different national instant payments platforms (for example, Singapore and Thailand, and Singapore and India). These allow near-instant cross-border payments, at relatively low cost and with the benefits of easy addressing and a confirmation-of-payee service. However, implementation of a whole series of bilateral linkages could be inefficient relative to a multilateral linkage system. Accordingly, the BIS Innovation Hub in Singapore has been working on Project Nexus and a framework that would entail a single connection to a multilateral hub that offered connections to all the other participating fast systems.<sup>15</sup> However, no such multilateral hub has yet gone live, and it remains to be seen whether multilateral systems prove feasible given possible challenges around the governance of international infrastructure.

Linkages of instant payment systems are also being studied in Europe. Together with the European Central Bank, Banca d'Italia and Danmarks Nationalbank, the Riksbank is investigating whether it might be possible to make instant payments between different currencies (currently the euro and the Swedish krona, and from 2025 also the Danish krone) that each use the ECB's TIPS infrastructure. In principle, the use of a common settlement infrastructure could more easily enable instant payments between the different jurisdictions. However, banks and other payment service

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<sup>15</sup> See [Nexus Overview | BIS Innovation Hub - Nexus](#).

providers may still need to develop payment services around these arrangements, for example links of addressing services with other markets and competitive foreign exchange services between national systems.

In addition, reports suggest that linkages between the Swish, Vipps (Norway) and MobilePay (Denmark and Finland) instant payments services could be possible. Such linkages may well be viable and worth pursuing given the close economic links between the four Nordic countries, although it is unclear to what extent they go beyond largely P2P payments and to also apply to corporate payments.<sup>16</sup>

The third component of the G20 Roadmap is to consider the feasibility of entirely new instruments or institutions that could transform cross-border payments. The use of CBDCs is being widely studied in this regard, including in a number of projects coordinated by the BIS Innovation Hub. These projects mostly involve consideration of wholesale CBDCs (for example, Projects Dunbar, mBridge and Mariana) although there has also been one involving retail CBDCs (Project Icebreaker), which the Riksbank participated in.<sup>17</sup>

These studies involving CBDCs have mostly yielded promising results. However, CBDCs have not been launched in any of the major economies, nor in Sweden, and any such decisions are probably some years away.<sup>18</sup> Hence, CBDCs would not appear to represent part of the near-term response to the current issues in cross-border payments.

**Overall, there seems to be a reasonable prospect that initiatives to create instant payments linkages with the euro area and other Nordic countries could be worthwhile. Such linkages are most easily done where, as in these cases, there is some degree of harmonisation of payment messages/schemes or infrastructure in the jurisdictions that are involved. However, to fully reap the benefits of new links with other markets will require some of the payment services discussed in Section 3.1, which provides an additional reason for those to be a high priority for the Swedish payments industry.**

### **3.3 Access of smaller entities to the payments system and the role of central bank settlement accounts**

This section focuses on issues regarding access to payment systems, especially in terms of access to central bank settlement accounts and measures that the Riksbank might take to promote competition in payment services.

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<sup>16</sup> It also remains to be seen whether any such links would include the ability to send funds account-to-account to users in another country, or might just be card-based options enabling retail purchases in another country.

<sup>17</sup> See [BIS Innovation Hub projects](#) for details of the projects completed by the BIS Innovation Hub.

<sup>18</sup> Among the large economies, the retail CBDC pilots being undertaken in China and India are probably most likely to lead to decisions to launch CBDCs. There seems to be limited prospect of CBDCs in the near term in any other G20 economies. The ECB is expected to take a decision on whether to proceed further on a digital euro in late 2025, but any actual launch would presumably be some years after that.



Fair and open access to payment and settlement systems by prospective payment service providers is an important element for promoting competition in payment services.<sup>19</sup> This includes both access to privately owned clearing and payment systems/services such as those provided by Bankgirot, Dataclearingen and Swish, as well as settlement services provided by the Riksbank. Access can be either direct, or indirect through another entity that is a direct participant in a system.

Market participants report that there are some problems with indirect access to payment and settlement systems in Sweden. Large banks have been withdrawing from this market, with reports indicating that concern about financial crime risks may be an element behind their decisions. And new payment service providers ('fintechs') report that they have trouble accessing payment accounts at Swedish banks, which is potentially contrary to Chapter 7 of the *Payment Services Act*.<sup>20</sup> These developments are harmful for competition, both from existing smaller players and potential new entrants.

In May 2022, the Riksbank opened its new RIX-INST service which provides real-time 24/7/365 settlement of transactions on a transaction-by-transaction basis. The service is so far only being used, from February 2024, for settlement of payments going through Swish, using a settlement model where all instructions are submitted by a single entity (the 'single instructing party model', which is also available to other systems/services). However, RIX-INST is also available for settlement of all types of NCT-compliant account-to-account payment instructions (using the 'standard' settlement model). From November 2024, all RIX-INST participants, according to the terms and conditions of RIX-INST, are obliged to accept payments based on the NCT Inst scheme.

RIX-INST allows for several variants of access models that should be attractive to smaller entities:

- Entities are able to be participants in RIX-INST without having to participate in RIX-RTGS (though they must have an agent arrangement with a RIX-RTGS participant for liquidity transfer purposes and payment of fees)
- It allows for an indirect participation arrangement where a payments service provider eligible for participation (known as a 'reachable party') uses another participant's settlement account
- It allows for a participant to choose to have another entity (known as an 'instructing party') submit and receive payment messages on its behalf
- In principle, a participant could use both of the arrangements in the two preceding points, that is neither sending its own instructions to RIX-INST nor maintaining its own account there.

In addition, changes are coming from the European Union that will broaden the type of entities that can be RIX participants. EU legislation (the revised Settlement Finality

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<sup>19</sup> Principle 18 of the *Principles for Financial Market Infrastructures* states that 'An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.' (Committee on Payment and Settlement Systems 2012).

<sup>20</sup> Law (2010:751) on Payment Services ('Lag om betaltjänster').



Directive, which entered into force in April 2024) will allow for payment institutions and e-money institutions – in addition to credit institutions, that is banks and credit market companies – to have direct access to payment infrastructures like RIX and Bankgirot's services.

However, the decision to admit a participant into RIX is based not only on eligibility reflecting the applicant's institutional status, but also on an assessment that the applicant would be able to operate safely and securely and would not bring undue risks to the system. This includes a wide range of factors, such as the applicant's proposed business model, financial status, operational readiness, IT systems, cybersecurity risk management, and so on.

The Riksbank is currently reviewing the conditions for opening up RIX to these new types of participants. As it does so, it will be important to strike an appropriate balance in the trade-off between competition and innovation on the one hand and safety on the other. **The Riksbank could consider whether it is possible for eligible participants in RIX to be subject to requirements that are tiered based on the risk (reflecting business models, size, proposed type of participation, et cetera) that an applicant would bring to the system.**

**The Riksbank might also consider whether there could be benefits to also allowing for the possibility of 'omnibus accounts' in RIX.** The Bank of England introduced this new type of account in 2021 as part of its RTGS renewal project. Under this model, an operator of a payment system (which is a member of the Bank of England's RTGS system) can hold funds in an omnibus account to fund its participants' balances with central bank money. This may allow them to offer innovative payment services, potentially including applications involving tokenised forms of private money, while having the security of settlement supported by central bank money. The arrangements that were available in RIX-RTGS for BiR to facilitate settlement of Swish payments were arguably analogous in many respects to an omnibus account. While the Riksbank did not view it as appropriate that settlement of such an important service as Swish did not occur in central bank money, there may be other services where omnibus account arrangements might be appropriate.

A few other recommendations regarding access issues include:

- There are countries where large numbers of small entities connect through specialist financial institutions that are not competitors in providing payment services to end users. These specialist institutions include 'bankers' banks' and 'corporate credit unions' in the United States, and 'aggregators' in Australia. **The Riksbank could study whether it would be appropriate for the authorities to do more to encourage entities specialising in providing indirect access to smaller financial institutions.**<sup>21</sup>
- **The Riksbank could investigate whether the level or structure of fees (including joining fees and fixed and variable ongoing fees) in private or public systems could be an inappropriate deterrent to participation.**

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<sup>21</sup> Currently there is only one such entity participating in RIX.

- **The Riksbank could engage with the FSA regarding concerns that AML/CFT concerns are leading large banks to be excessively risk averse in their provision of indirect access arrangements and in providing account services to non-bank payment service providers.**
- **While RIX-INST is already providing 24/7/365 settlement, the Riksbank could continue to monitor the case for longer operating hours for its RIX-RTGS service, including as part of Sweden’s response to the G20’s cross-border payments roadmap.**

### 3.4 Retail CBDC

Central bank digital currency (CBDC) is a potential new form of digital money that would be a liability of the Riksbank. A retail (or general-purpose) CBDC, or e-krona, would be like a digital version of cash that is universally accessible, presumably via wallets on phones and possibly via purpose-built devices like smart cards. There could also be wholesale CBDC, which – similar to settlement accounts at the Riksbank – would be accessible only to a more limited range of entities.

Like cash and settlement account balances, the unit of account of any Swedish CBDC would be the Swedish krona. A CBDC would be convertible at par (that is one for one) with other forms of money, and it presumably would be specified to serve as legal tender. While any eventual e-krona would be issued by the Riksbank, it is generally expected that most customer-facing activities involved in distributing it to users would be undertaken by private-sector entities.

The Riksbank conducted an extensive project involving retail CBDC, the e-krona project, over 2016-23 and has gained substantial knowledge on the topic.<sup>22</sup> Its judgement is that an e-krona could in the longer term help on many issues that raise concerns in the payments system, especially regarding the declining usability of cash. For example, an e-krona could help with preparedness by contributing to a more resilient payment system and it could be a tool to strengthen inclusion in the payments market if it could be designed to overcome some of the problems that have resulted in Sweden having an unacceptably high proportion of the population not having access to bank accounts. It could potentially also help maintain competition in the payments market and make cross-border payments more efficient. Indeed, the case for a retail CBDC is probably stronger in Sweden than in most other advanced economies.

However, the 2023 report commissioned by the Riksdag on the role of the State in the payment market did not find a sufficiently strong case for the issuance of an e-krona at that time.<sup>23</sup> This reflected the inquiry’s views that Sweden had a well-functioning monetary and payments system, that cash would remain usable for the foreseeable future, and that regulation and oversight were alternative tools for dealing with policy concerns regarding money and payments. Nevertheless, the inquiry recommended that the Riksbank should continue to evaluate the case for an e-krona, with particular

<sup>22</sup> For example, see Sveriges Riksbank (2024) for the most recent report from the technical pilot, and Ingves et al. (2022) for a discussion of the case for a retail CBDC in Sweden.

<sup>23</sup> *Staten och betalningarna* ('The State and Payments'), SOU 2023:16.

focus on developments in the euro area regarding a potential digital euro, so that it would be possible to introduce an e-krona within a reasonable time if such a decision was taken by the Riksdag.

The European Central Bank has a major project underway that should help establish whether retail CBDCs are worth implementing in advanced economies. The ECB project includes a wide range of workstreams focusing on different aspects of the payments chain (for example, household demand, merchant acceptance and the provision of payment services by payments providers) that would be required for the successful launch of a digital euro. In addition, other central banks (for example, the Bank of England) are seriously considering the case for CBDC. In the event that these central banks were to take a decision to issue CBDC, it would strengthen the case for e-krona issuance, in part to safeguard the role of the krona in Sweden's economy.

However, for the time being, retail CBDCs are still unproven in many respects. The limited number of retail CBDCs introduced to date in other jurisdictions (the Bahamas, Jamaica, Nigeria and the Eastern Caribbean Central Bank region) have had very low adoption.<sup>24</sup> **Accordingly, an approach of closely watching the digital euro project and being ready to be a fast follower, possibly either using the ECB's infrastructure or borrowing heavily from its design, seems a very logical strategy for the Riksbank.**

### 3.5 Wholesale CBDC

As noted above, wholesale CBDC would be a new form of liability of the central bank, available to a more limited range of entities. Arguably it would represent only a modest evolution of existing financial systems, given that central banks have long provided settlement or reserve accounts, in digital form, to banks and a few other types of entities. The innovation with wholesale CBDC would be that the access to central bank's balance sheet would most likely be via a 'tokenised' form of settlement balances.<sup>25</sup>

Tokenisation refers to the process of representing claims in a digital form that allows them to be transacted on programmable platforms, typically based on distributed-ledger technology (DLT) and using smart contracts (self-executing code that is triggered when prespecified events or instructions occur).<sup>26</sup> Tokenisation can be used for a range of different claims or assets:

- Unbacked cryptoassets such as bitcoin, other cryptocurrencies, initial coin offerings, non-fungible tokens, et cetera.
- So-called stablecoins, which to date have typically been issued by fintech firms, been only lightly regulated, and mostly linked to the US dollar and backed by USD assets.

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<sup>24</sup> See, for example, Noll (2024).

<sup>25</sup> There is no presumption that any retail CBDC would use tokenisation, distributed-ledger technology or blockchains. While some of the retail CBDCs that have been implemented or piloted internationally have used these technologies, many others (most notably the Chinese digital yuan) do not and rely on more standard technologies. However, experimentation to date with wholesale CBDCs has invariably used these new technologies.

<sup>26</sup> See Aldasoro et al. (2023).

- Real-world assets, including a wide range of traditional asset classes (such as bonds, equities and real estate) as well as new asset classes (for example, nature-based assets, for which markets are still developing).
- Bank deposits, which are referred to either as deposit tokens or tokenised deposits.
- CBDCs, where the expectation is that if wholesale CBDCs are issued they will be tokenised and use DLT, whereas retail CBDCs are more likely to rely on traditional technologies.

In the advanced economies there is probably more work underway currently on wholesale CBDC than on retail CBDC. A recent global survey by the Bank for International Settlements concluded that ‘Over the course of 2023, there has been a sharp uptick in experiments and pilots with wholesale CBDCs – mainly in advanced economies (AEs), but various emerging market and developing economies (EMDE) also stepped up their wholesale CBDC work. Overall, the likelihood that central banks will issue a wholesale CBDC within the next six years now exceeds the likelihood that they will issue a retail CBDC.’<sup>27</sup>

Many of the early experiments with wholesale CBDC explored its possible use in cross-border payments. There have been a number of projects coordinated by the BIS Innovation Hub, including Projects Jura, Dunbar and mBridge, amongst others.<sup>28</sup> Rationales for the use of wholesale CBDC include that it could be available on a 24/7/365 basis, benefit from the use of atomic settlement of transactions between currencies, and result in a reduced number of intermediaries in transaction chains.<sup>29</sup>

However, the recent focus of experiments with wholesale CBDC has been shifting to its potential use as a settlement asset for transactions in tokenised real-world assets. While the tokenisation of real-world assets has been limited to date, many observers expect that there will be significant growth in this area, perhaps even a general shift in the way that many assets are issued, traded and held. If so, there will need to be a safe settlement asset for trading in these assets. New forms of private money (that is, stablecoins or deposit tokens) could potentially partly fill this need, though the regulatory frameworks for these are still evolving, and it remains to be seen how they might be adopted and used. CBDC would be the safest settlement asset and indeed might be required in many contexts by international standards such as the *Principles for Financial Market Infrastructures*.<sup>30</sup>

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<sup>27</sup> See Di Iorio et al. (2024).

<sup>28</sup> See [BIS Innovation Hub projects](#).

<sup>29</sup> Atomic settlement is the use of a smart contract to link two assets to ensure that the transfer of one asset occurs if and only if the transfer of the other asset also occurs (for example, to achieve delivery-versus-payment in a securities transaction or payment-versus-payment in a foreign exchange transaction).

<sup>30</sup> The CBDC pilot conducted by the Reserve Bank of Australia and the Digital Finance Cooperative Research Centre in 2022-23 pointed to five attributes of CBDC that could be valued in potential uses cases: its safety, as a claim on the central bank; users could directly control CBDC without relying on an intermediary; programmability based on smart contracts; the ability to enable atomic settlement of transactions in tokenised assets; and the transparency that some platforms and applications might allow. See Reserve Bank of Australia and DFCRC (2023).

Research projects underway at a number of central banks, most prominently the Swiss National Bank and the European Central Bank, are focusing on how central bank reserves can best support settlement of transactions in tokenised real-world assets.<sup>31</sup> The Swiss National Bank is possibly most advanced in its experimentation with wholesale CBDC, having issued tokenised francs onto the platform of the private-sector Swiss Digital Exchange, which is owned by the SIX Group, the operator of the Swiss RTGS system.

A central question being researched is whether settlement balances in existing RTGS systems, when combined with some form of reservation or escrow linkage to tokenised asset systems, might be adequate to support transactions in tokenised assets. Alternatively, is tokenised central bank money (wholesale CBDC) likely to be required, perhaps in some arrangement where it supports the use of tokenised private money (deposit tokens and stablecoins)?

While it is too early to be certain, it seems quite likely that wholesale CBDC will indeed be required to fully realise the benefits of tokenised financial markets, that is that there may be an evolution in the way that central bank money is provided to eligible counterparties. This might be for use on platforms shared with the private sector or with central banks in other jurisdictions. Some recent proposals are for CBDC to be used on ledgers with tokenised commercial bank money (for example, the Regulated Liabilities Network) or with tokenised assets (for example, the Bank for International Settlements' envisaged 'unified ledger') or with other CBDCs (for example, the BIS Innovation Hub's Project mBridge and Project Agorá).<sup>32</sup>

If and when decisions are taken to issue wholesale CBDCs, it is likely that implementation will be able to occur more quickly than would be the case for retail CBDCs. This is because the task of building an ecosystem will be more contained than for retail CBDCs – wholesale CBDCs might well be issued only to those entities that already hold settlement accounts at the central bank. However, a rapid shift to wholesale CBDC issuance by central banks seems somewhat unlikely, given the need to fully explore the technology issues, including the possible exploration of platforms shared across jurisdictions, and the desirability of international agreement on the important related issue of the regulatory treatment of stablecoins and deposit tokens. **Nevertheless, it will be important for the Riksbank to continue to follow the ongoing international research on wholesale CBDC closely (for example, the current ECB project) and participate in projects with other central banks where possible. Initiation of domestic pilot projects would be quite demanding in terms of resources, but it may be worth considering any opportunities that may arise to undertake research projects with capable external partners.**<sup>33</sup>

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<sup>31</sup> See Neuhaus and Plooi (2023) and Jordan (2024).

<sup>32</sup> See, for example, The Regulated Liability Network (2022) and Bank for International Settlements (2023, 2024).

<sup>33</sup> Examples of central banks conducting projects with external partners include the Swiss National Bank's project with the Swiss Digital Exchange and the Reserve Bank of Australia's project with the Digital Finance Cooperative Research Centre (Reserve Bank of Australia and DFCRC 2023).

### 3.6 The decline of cash

While this report is mostly about electronic payments, it is impossible to think about the future of payments without also considering the role of cash.

As is well known, the decline in the role of cash is more advanced in Sweden than elsewhere, with only Norway being somewhat comparable. This decline is both in terms of holdings of cash (the ratio of currency on issue to GDP has fallen from around 4 per cent at the turn of the century to below 1 per cent) and use of cash (the Riksbank's recent household survey shows that only 10 per cent of the population had used cash for their most recent in-store purchase).

There is also evidence in the latest survey that cash is becoming harder to use and that if this trend was to continue it would have greatest effects on more vulnerable groups, most notably older and lower-income households. Accordingly, the Riksbank is already taking measures to preserve the cash system, including to open two additional banknote depots as well as allowing greater non-bank access to its depots. The Riksbank has also called for enhanced regulatory measures to safeguard cash distribution services to businesses and other end users. And it has supported stronger protections on the right to use cash, similar to those present in some neighbouring jurisdictions, including a general obligation for merchants to accept cash for purchases of essential goods and services such as food, pharmaceuticals and fuel.

It is noteworthy that the useability of cash is now also becoming more of an issue in other jurisdictions and that policymakers are responding. For example, in the euro area, the European Commission has proposed stronger protections for the possibility of using cash (European Commission 2023). And in Australia, the Reserve Bank has stepped up its engagement with the private sector on the distribution of cash, given concerns over the financial viability of the dominant cash-in-transit company. More broadly, it is noteworthy that there do not appear to be any jurisdictions internationally that would be comfortable with cash becoming largely unusable in their economies.

It is possible that, in the longer term, measures to preserve the useability of cash in Sweden might no longer be required. For example, an e-krona (if introduced) could potentially help with both financial inclusion and preparedness, especially if it allowed for offline usage. However, for the time being, there is still a reasonably functioning cash system and it plays an important payments inclusion role for many Swedes and also as part of Sweden's resilience strategy.

**Accordingly, there appears to be a very good case for other measures to ensure the continuing viability of the cash system for at least the short term. This could include measures to require both banks to continue to provide adequate cash services and merchants to accept cash for essential goods and services.**

Where such measures imply significant costs for particular private-sector entities, it is reasonable that there be a discussion as to who should bear these costs. However, it may be, at least to some degree, that these costs should be viewed as part of the

‘social licence to operate’ of the major banks and indeed also the larger supermarket groups.

## 4 Industry governance: How to support the evolution of the payment system

In most market economies, the provision of payment services can be characterised by competition between private providers in the customer-facing payment services layer, public-sector monopoly provision in the settlement layer, and some degree of partnership between public and private entities in the payment and clearing systems in the middle layer. And this middle layer is where it is most apparent that payments systems are networks, since most payments occur between customers of different banks or payment institutions.

Networks require various forms of shared infrastructure and systems, physical as well as more intangible, in the form of rules and standards. For payments systems to work efficiently, entities that are competitors must work together on common infrastructure so they can bring services to their respective customers, the end users of the payments system. This raises both potential coordination challenges (can entities that are normally fierce competitors work effectively together?) and potential competition issues (the possibility of incumbents seeking to limit access to the infrastructure to keep new entrants out).

It is the governance arrangements of national payments systems that determine what infrastructure and systems are established, how they are subsequently operated, and how different parties work together to bring payment services to end users of the payments system. If we want to fully understand Sweden’s current payments infrastructure and the way that it is meeting or not meeting the needs of end users, it may be useful to look at governance arrangements of the payments system. Important elements of industry governance include the regulatory framework set by the legislative arm, the existence of self-regulatory industry associations, and the ownership and governance of important pieces of private-sector payments infrastructure.

To shed light on this important issue, this section compares and contrasts industry governance arrangements in Sweden with those in some other countries.

### 4.1 The role of the public sector in industry governance

Internationally, a desire to overcome industry coordination problems has often been a rationale for the public sector to provide strategic direction for the payments system. There are a range of examples that show that large entities that are competitors can have trouble coming together to build necessary new shared infrastructure. This may be due to cost concerns (they may prefer to spend money on their own customer-facing services rather than on shared infrastructure), concerns that their competitors may benefit more from new infrastructure, or simply coordination failures reflecting factors such as different investment cycles. The risk is



that innovation and new infrastructure may be delayed, and services provided to end users may suffer. Accordingly, there may be a role for the public sector to set priorities for banks and payment system operators to help overcome coordination failures.

Internationally, where such guidance comes from a regulatory agency, it is most likely to come from the central bank. This may be because the central bank is the primary regulator of the payments system in many countries. Or it may be that the central bank has the most significant links with private-sector entities participating in the payments system through its roles – depending on the jurisdiction – as provider of settlement infrastructure, issuer of banknotes, counterpart in monetary policy operations and banker to the government. For example, central banks have played major roles in encouraging and then participating in the development of instant payment systems in jurisdictions ranging from Brazil and India to the European Union and the United States.

Certainly there are some good examples of the major Swedish banks collaborating to provide improved payment services, most notably with Bankomat, BankID and Swish. However, there are also examples of unsuccessful attempts at working together, most recently in the high-profile failure of the proposed P27 Nordic Payments initiative. And the recent announcement from Finansinspektionen about the deficiencies in Bankgirot's infrastructure and the measures it is taking regarding Bankgirot's owners points to serious problems in the governance of that organisation.

Accordingly, there may well be a case for increased strategic guidance to private-sector entities from Swedish regulators, presumably led by the Riksbank. The increased role of the Riksbank's RIX-INST settlement system, where potentially most Swedish payments could be settled instantly in the future, might suggest an enhanced role for the Riksbank to provide direction for the payments system, including the activities of entities (such as Bankgirot and GetSwish) which provide payment services that rely on Riksbank settlement services.

Alternatively, given that there are a significant number of Swedish regulators with different responsibilities for the payments system, it may be that the Riksdag or the government, or alternatively the Ministry of Finance, could be better placed to provide an overarching vision for the evolution of the Swedish payments system. Indeed, there have been a few recent examples internationally where jurisdictions have considered whether it might be desirable for some form of government oversight of the strategic direction for the payments system.

For example, in the United Kingdom, the primary recommendation of the 2023 *Future of Payments Review* was that the government (through the Treasury) should develop a high-level 'national payments vision and strategy' to guide industry and regulatory activity and bring clarity to its future desired outcomes for UK payments (Garner 2023). This report cited a number of factors for its recommendation, including the importance of the nation's payments infrastructure for economic growth, the rate of technological change and significant number of initiatives underway in the sector, and the complexity of industry governance with multiple industry and regulatory bodies.



And in Australia, the 2021 *Payments System Review* noted the increased complexity of payments issues and the acceleration of financial innovation as rationales for the need for enhanced leadership, vision and oversight in the payments ecosystem. It recommended that the government (through the Treasurer) should develop a strategic plan for the payments ecosystem in collaboration with regulators, industry, and representatives of consumers and businesses. The first strategic plan was published in 2023 (Australian Government 2023).

#### **4.2 The role of the private sector in industry governance**

Table 2 provides an overview of some of the main industry entities involved in coordinating the operation of the Swedish payments system or providing important physical or other infrastructure for payments.<sup>34</sup>

One clear observation from Table 2 is that the large banks play a dominant role in the governance of the Swedish payments system, with limited representation from smaller banks and – in contrast to many other jurisdictions – no representation from non-bank payment service providers.

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<sup>34</sup> Note that I understand that the ownership of P27 AB and Bankgirot AB was being reviewed around the time I prepared this report, with the expectation that OP Financial Group, which is not active in Sweden, would no longer have an ownership share. Bankgirot's website continued to refer to OP as having an equal ownership share as of late June 2024, though Finansinspektionen's June 2024 announcement regarding Bankgirot's owners did not refer to OP.

**Table 2. Governance of Important Private Entities in the Swedish Payments System**

Organisation and role	Ownership/membership structure	Board composition
Svenska Bankföreningen, the Swedish Bankers' Association	32 members, includes banks (domestic and branches of foreign banks) plus finance companies and mortgage institutions	5 members from large Swedish/Nordic banks, 4 from other banks, and the CEO
DataClearingen, owner of the account-to-account system, which is operated by Bankgirot	Owned by Swedish Bankers' Association	As above
Bankgirot AB, operator of most key Swedish clearing infrastructure	Owned by P27 AB	9 members: 5 from major banks, plus chair, staff representative and (effective early 2024) also 2 independents
P27 AB, owner of Bankgirot AB (operator of most key Swedish clearing infrastructure)	6 large Nordic banks (Nordea, Danske Bank, Handelsbanken, OP Financial Group, SEB and Swedbank)	6 members from owner banks plus the CEO
GetSwish AB, owner of the instant payment service	Danske Bank, Handelsbanken, Länsförsäkringar Bank, Nordea, SEB, Swedbank and Sparbankerna	Chair, 5 members from owner banks and the CEO
BankID, the identity service for online banking and other services, owned by Finansiell ID-Teknik BID AB	Swedbank, SEB, Danske Bank, Skandiabanken, Handelsbanken, Länsförsäkringar Bank and Ikano Bank	10 members from 6 large banks
Nordic Payments Council, created to harmonise payments in the Nordic region; creates and manages payment schemes	The finance or banking associations of Denmark, Finland, Norway and Sweden, plus around 70 banks or credit institutions from those countries	Four directors, one each from the finance or banking associations of Denmark, Finland, Norway and Sweden

Sources: Company websites and other sources.

Payments associations are quite common in other jurisdictions – for example, the Dutch Payments Association, Payments Canada, Payments New Zealand and the Australian Payments Network. They are typically industry organisations which govern and set standards for co-operative payment systems and are often referred to as self-regulatory organisations. Eligibility for membership is typically broader than just banks, often also including non-bank payment service providers, commercial payment schemes and even technology companies. Their boards typically include independent directors and often a representative of the central bank.

For example, Payments Canada (previously the Canadian Payments Association) is a non-profit, public-purpose organisation that is responsible for Canada's national systems for the clearing and settlement of payments. Its objectives include the efficiency, safety and soundness of the payments system, as well as the interests of end users. It is established under an act of parliament and overseen by the Bank of Canada and the Ministry of Finance. Its membership includes banks and other deposit-taking institutions, the Bank of Canada, and some other entities including life insurance companies, securities dealers, and money market mutual funds. The government has also recently proposed expanding eligibility for membership to include other entities including payment service providers and technology companies.

Its 13-member board is composed of seven independent directors, five directors representing members, as well as the CEO.

In the Netherlands, the Dutch Payments Association has around 50 members and is open to large banks as well as newer and smaller institutions, including electronic money institutions, payment institutions and payment service providers. Its board consists of nine members, including three independent directors, three directors representing the largest banks, and three directors appointed by the medium-sized banks, smaller banks and payment institutions respectively.

And in Australia, membership of the Australian Payments Network is open to participants in payment systems, as well as operators of payment systems, and technology and other service providers. Its 13-member board consists of three independent directors, four directors representing the largest banks, one director representing credit unions, two directors representing payment systems and other members, one director from the Reserve Bank, as well as the CEO.

In contrast, there is no national payments association in Sweden with responsibility for industry coordination or self-regulatory activities and including broad membership. Instead, where industry coordination occurs it has been through the Swedish Bankers' Association, which has a relatively narrow membership.<sup>35</sup>

However, the recently established Nordic Payments Council (NPC) is now taking on some standards-setting roles across the Nordic area. The NPC was founded in late 2018 and its main objective is to contribute to harmonised payments in the Nordics. It has developed three schemes or rulebooks – the NPC Credit Transfer, Instant Credit Transfer and Confirmation of Payee Schemes – and it attempts to follow the European Payments Council's scheme rulebooks as much as possible. The NPC appears to be playing a very useful role in the broader Nordic region. However, it has a fairly narrow mandate relative to payments associations elsewhere and to date its Swedish membership does not go beyond the membership of the Bankers' Association.

In the absence of a national payments association, industry governance in the Swedish payments system has largely been in the hands of the different systems that provide payments-related services, and their owners, which in most cases are the large banks. And here it is noteworthy that the governance of the major private-sector entities do not appear to be subject to any public-interest mandate.

This stands in contrast to other countries, where there is often some form of public-interest mandate for payments infrastructure providers (for example, Payments Canada, the National Payments Corporation of India, Australian Payments Plus, and Pay.UK). This public-interest mandate may be either imposed (as in Canada) or encouraged by the public sector. It typically reflects a view that outcomes in the payments system are very important for the broader economy. It may also reflect

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<sup>35</sup> The other Nordic countries also do not have specialist payment associations. The organisations equivalent to the Swedish Bankers' Association (Finans Danmark, Finans Norge and Finance Finland) have somewhat broader membership than the SBA, typically including some combination of insurance, asset management and securities trading companies. However, similar to the SBA, membership typically does not extend to challenger payment service providers, nor is there board representation by independent directors.

concerns that there is a tendency in most economies for a single (monopoly) provider of much payments infrastructure, and where infrastructure is owned by large incumbent banks, there is the possibility that they will attempt to limit access in ways that might harm smaller competitors or potential new entrants.

For example, in the United Kingdom, Pay.UK was launched in 2018 as the operator and standards body for the UK's interbank payment systems. It brought together three domestic retail payment systems – the fast payment, bulk payment and cheques systems - into a single, consolidated, not-for-profit operation. The company's articles state that it 'is set up for the good of society and the economy as a whole. Its purpose is to support a vibrant UK economy enabling a globally competitive payments industry through the provision of robust, resilient, collaborative retail payment services, rules and standards for the benefit, and meeting the evolving needs, of all users.'<sup>36</sup> Pay.UK has 'guarantors' rather than shareholders and currently has around 40 guarantors, representing a cross-section from across the payments ecosystem, including both bank and non-bank payment service providers, payment processors, infrastructure providers, and others. Its board includes seven independent directors, two directors from the industry (from one large and one small institution) and the CEO.

In Australia, Australian Payments Plus (AP+) was formed following the merger of three domestic payment systems (the fast payment and bill payment systems, and the domestic debit card scheme). The 2021 merger was subject to significant scrutiny from the competition regulator, including commitments to continue to provide certain services as well as safeguards for the interests of end users and new entrants to the payments system. The merged company operates in the public interest and is intended to be economically self-sustaining rather than profit-maximising. While Australia's four major banks had full or majority ownership of the three predecessor companies, the governance of the new entity includes a much wider range of interests. The board of AP+ is comprised of 13 directors, including four independents, four representing the four major banks, two representing smaller bank shareholders and three from non-bank shareholders (two from large retailing companies and one from a non-bank payment service provider).

### 4.3 Conclusions on industry governance

Industry governance arrangements are important for ensuring that private-sector entities work productively together and also in ways that promote the interests of end users of the payments system. Other countries appear to have more advanced frameworks for industry governance than Sweden.

The Riksbank has three existing stakeholder consultation groups. It convenes the Swedish Infrastructure Council for Payments and Securities (Infrastrukturrådet för betalningar och värdepapper), a group of entities providing or using the infrastructure for payments and securities. The Retail Payments Council (Betalningsrådet) consists of representatives of various providers of payments services, public sector agencies with

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<sup>36</sup> See [Pay.UK Limited, 'Articles of Association'](#).

mandates including payments, and representatives of the business and consumer sectors. And the Cash Handling Advisory Board (Kontanthanteringsrådet) includes representatives from banks, cash depot companies, security transport firms, merchants and relevant public authorities. These are useful for the exchange of views on developments in the payments system, for enabling the Riksbank to convey its views on preferred directions for the payments system, and to help the Riksbank to identify issues of concern which can be raised with the Ministry of Finance or the Riksdag as required. However, these three groups are largely discussion or consultation forums, with the Riksbank having limited scope to direct the industry, and they are not intended to be forums where industry participants come together to take (sometimes difficult) decisions about investments in future infrastructure. The Riksbank could consider seeking to lift the status, or increase the powers of, these groups.

More broadly, this raises the question of whether some industry governance issues could be dealt with simply by having consumer or business representatives sit on some payments industry groups. However, the experience over 2007-15 with the short-lived UK Payments Council suggests that such bodies may not be particularly effective, either in terms of representing the interests of end users or making important decisions about the future direction of the payments industry. Instead, it may be better to: (1) ensure that the mandate for payments industry bodies or systems include some reference to the public interest; and (2) for the central bank (or other public entity) to convene a group consisting only of end users (for example, like the Reserve Bank of Australia's Payments Consultation Group) as a more structured mechanism for users of the payments system to express their views on payments system issues as an input to the policy formulation process.

**It is important to recognise that the payments ecosystem is a lot more complex than in the past. In addition to banks, it now includes a wide range of entities such as non-bank acquirers, payment initiation and account information service providers, digital money transfer operators, technology providers, payment networks and so on. Accordingly, based on the discussion above, and especially given the issues with Bankgirot and the P27 initiative, it may be worth considering whether some changes to Swedish industry governance might be desirable including:**

- **A greater role for the authorities (whether the Riksdag, government, Finance Ministry or Riksbank) in providing high-level strategic guidance on priorities for the payments industry and in representing the interests of end users of the payments system.**
- **Establishing some form of national payments association with a role for smaller banks, non-bank payment service providers and potentially also the Riksbank.**
- **The introduction of some form of public-interest mandate for operators of important national payments infrastructure.**

There is, of course, a need to find a delicate balance between the interests of different parties in matters of infrastructure and its governance. It is important to recognise that the largest banks in a country have typically invested significantly in the

existing infrastructure and have a legitimate major interest in payments system outcomes. But at the same time, they may struggle to find consensus to make the necessary infrastructure investments or they may have incentives to try to use their ownership of infrastructure to prevent new entrants into the payments system, which may impede innovation and result in poorer outcomes for end users of the payments system. Finding such a balance may not be easy, but there are numerous examples internationally of changes to industry governance that explicitly incorporate the interests of end users and better reflect the broader range of entities that are now participating in the payments ecosystem.

## 5 Conclusion and overview of recommendation

This section summarises the main recommendations of my report and their rationale.

**There are some important priorities in the area of account-to-account payments in Sweden, in both bulk/batch payments and instant payments.** First, as a result of the wasted effort over 2018-23 on the P27 pan-Nordic project, the Swedish payments industry – especially Bankgirot, the Bankers Association and the major banks – finds itself with a significant ‘tech debt’ or ‘payments infrastructure debt’ to deal with the issues that it started working on in 2017. **There is a large body of work to be done to modernise the Swedish bulk/batch payment services, make them compliant with financial crime regulation and ensure their robustness in an environment of greater concern over resilience. This will be a multi-year project and the industry should be as transparent as possible with the authorities and end users of the payments system as this transformation is planned and implemented.**

Second, a comparison with other countries suggests there are some aspects where the implementation of instant payments in Sweden is now behind what might be viewed as the leading practice internationally. It is certainly true that not all payments need to be instant, but there are presumably many existing payments that would already benefit from moving to real-time and surely many new business models that could emerge with more available real-time payments. **Banks should take advantage of the new RIX-INST settlement system to allow instant payments for all types of customer accounts – households, businesses and government entities – both sending and receiving, that is, truly ‘all-to-all’ instant payments. This would go beyond the current Swish service, which is still largely focused on household payments. In addition, banks should provide instant payments via a range of interfaces, and not just through the current Swish interfaces. And to fully reap the benefits of instant payments, it would be desirable to have some form of clearing infrastructure that provides useful functionality around these payments, including centralised fraud analytics and a confirmation-of-payee service.**

There is a significant amount of work underway internationally on the G20’s Roadmap for Enhancing Cross-border Payments so as to meet some ambitious targets – in terms of the cost, speed, access and transparency of cross-border payments. The Riksbank and other relevant Swedish authorities will have to continue to work with the domestic payments industry to ensure that actions from the G20 Roadmap are

implemented in Sweden. In addition, there seems to be a reasonable prospect that initiatives to create instant payment systems linkages with the euro area and other Nordics could be worthwhile to improve cross-border payments with these jurisdictions. However, to fully reap the benefits of new payment links with other markets will require instant domestic payments within Sweden, which provides an additional reason for that to be a high priority for the Swedish payments industry.

Fair and open **access to payment and settlement systems** by prospective payment service providers is an important element for promoting competition in payment services. In May 2022, the Riksbank opened its new RIX-INST service which allows for several types of access models that should be attractive to smaller entities. Also, the Riksbank is reviewing the conditions for opening up RIX to payment institutions and e-money institutions, in line with the EU's revised Settlement Finality Directive. As it does so, it will be important to strike an appropriate balance in the trade-off between competition and innovation on the one hand and safety on the other. **The Riksbank could consider whether it is possible for eligible participants in RIX to be subject to requirements that are tiered based on the risk (reflecting business models, size, proposed type of participation, et cetera) that an applicant would bring to the system.**

There are countries where large numbers of small entities connect through specialist financial institutions that are not competitors in providing payment services to end users. These specialist institutions include bankers' banks and corporate credit unions in the United States, and aggregators in Australia. **The Riksbank could study whether it would be appropriate for the authorities to do more to encourage entities specialising in providing indirect access to smaller financial institutions. And the Riksbank could engage with the FSA regarding concerns that AML/CFT concerns are leading large banks to be excessively risk averse in their provision of indirect access arrangements and providing account services to non-bank payment service providers.**

The Riksbank conducted an extensive project involving retail CBDC, the e-krona project, over 2016-23 and has gained substantial knowledge on the topic. An e-krona could potentially help in the longer term on many issues that raise concerns in the payments system, especially regarding the declining usability of cash. For example, an e-krona could contribute to a more resilient payment system, be a tool to strengthen inclusion in the payments market, help maintain competition in the payments market and make cross-border payments more efficient. Indeed, the case for a retail CBDC is probably stronger in Sweden than in most other advanced economies.

However, for the time being, retail CBDCs are still unproven in many respects, and the limited number of retail CBDCs introduced to date in other jurisdictions have had very low adoption. **The European Central Bank has a major project underway that should help establish whether retail CBDCs are worth implementing in advanced economies. An approach of closely watching the digital euro project and being ready to be a fast follower, possibly either using the ECB's infrastructure or borrowing heavily from its design, seems a very logical strategy for the Riksbank.**



There is also significant work underway internationally into **wholesale CBDC**, or a potential new ‘tokenised’ form of settlement balances at central banks that would draw on some of the building blocks (distributed-ledger technology, smart contracts, atomic transactions, et cetera) used in the cryptoassets world. Many of the early experiments with wholesale CBDC explored its possible use in cross-border payments. More recently, the recent focus of experiments has shifted to the potential use of wholesale CBDC as a settlement asset for transactions in tokenised real-world assets, such as bonds, equities or real estate. While the tokenisation of real-world assets has been limited to date, many observers expect that there will be significant growth in this area, perhaps even a general shift in the way that many assets are issued, traded and held. If so, there will need to be a very safe settlement asset for trading in these assets, which might coexist with tokenised forms of private money such as stablecoins and deposit tokens.

It is too early to be certain, but it seems quite likely that wholesale CBDC will be required to fully realise the benefits of tokenised financial markets, that is that there should be an evolution in the way that central bank money is provided to eligible counterparties. **While a rapid shift to wholesale CBDC issuance by central banks seems somewhat unlikely, it will be important for the Riksbank to continue to follow the ongoing international research on wholesale CBDC closely (for example, the current ECB project) and participate in projects with other central banks where possible. Initiation of domestic pilot projects would be quite demanding in terms of resources, but it may be worth considering any opportunities that may arise to undertake research projects with capable external partners.**

The decline in the role of **cash** is more advanced in Sweden than elsewhere, but the useability of cash is becoming an issue in other jurisdictions and policymakers there are responding. Indeed, I am not aware any jurisdictions internationally that would be comfortable with cash becoming largely unusable in their economies. While the economics of cash distribution are challenging, Sweden still has a reasonably functioning cash system and cash continues to play an important role both for payments inclusion and as part of Sweden’s resilience strategy. **Accordingly, and given also that the Riksbank is opening additional cash depots, there appears to be a very good case for other measures to ensure the continuing viability of the cash system for at least the short term. This could include measures to require both banks to continue to provide adequate cash services and merchants to accept cash for essential goods and services.** It is possible that such measures will only be needed for a limited time – for example, an e-krona (if introduced) could help with both financial inclusion and preparedness, especially if it allowed for offline usage. Where such measures imply costs for private-sector entities such as the major banks and the larger supermarket groups, it may be that some part of these costs should be viewed as part of the ‘social licence to operate’.

Finally, the problems with Bankgirot and the P27 initiative have highlighted potential **weaknesses in the governance of the Swedish payments industry.** Industry governance arrangements are important for ensuring that private-sector entities work productively together and also in ways that promote the public interest. Some other countries appear to have more advanced frameworks for industry governance than



Sweden, with arrangements that explicitly incorporate the interests of end users and better reflect the broader range of entities – including non-bank acquirers, payment initiation and account information service providers, digital money transfer operators, technology providers, payment networks and so on – that are now participating in the payments ecosystem.

**Accordingly, it may be worth considering a few possible changes to industry governance in the Swedish payments system. First, it may be desirable for the authorities (whether the Riksdag, government, Finance Ministry or Riksbank) to play a greater role in providing high-level strategic guidance on priorities for the payments industry and in representing the interests of end users of the payments system. Second, some form of national payments association could be established with a role for smaller banks, non-bank payment service providers and potentially also the Riksbank. Third, it may be desirable to introduce some form of public-interest mandate for operators of important national payments infrastructure.**

## References

Aldasoro, Inaki, Sebastian Doerr, Leonardo Gambacorta, Rodney Garratt and Priscilla Koo Wilkens (2023), 'The tokenisation continuum', *BIS Bulletin*, no. 72, Bank for International Settlements.

Australian Government (2023), *A Strategic Plan for Australia's Payments System*, June.

Bank for International Settlements (2023), 'Blueprint for the future monetary system: improving the old, enabling the new', *BIS Annual Economic Report*, June, pp. 85–118.

Bank for International Settlements (2024), 'Project Agorá: central banks and banking sector embark on major project to explore tokenisation of cross-border payments', press release 3 April.

Claussen, Carl Andreas and Anders Mølgaard Pedersen, 'Cross-border payments in the spotlight', *Sveriges Riksbank Economic Review*, no. 2 2022, pp. 26–46.

Committee on Payment and Settlement Systems (2012), *Principles for financial market infrastructures*, Bank for International Settlements, April.

Committee on Payments and Market Infrastructure (2021), *Developments in retail fast payments and implications for RTGS systems*, Bank for International Settlements, December.

Di Iorio, Alberto, Anneke Kosse and Ilaria Mattei (2024), 'Embracing diversity, advancing together – results of the 2023 BIS survey on central bank digital currencies and crypto', *BIS Papers* no. 147, Bank for International Settlements.

Engström, Nina and André Reslow (2022), 'Remittances – the overlooked payments', *Sveriges Riksbank Economic Review*, no. 2, pp. 47–64.

European Commission (2020), 'Communication from the Commission to the European parliament, the Council, the European economic and social committee and the Committee of the regions: on a Retail Payments Strategy for the EU', COM/2020/592 final.

European Commission (2023), 'Proposal for a Regulation of the European Parliament and of the Council on the establishment of a framework to facilitate sustainable investment', COM/2023/364 final.

Financial Stability Board (2020), *Enhancing Cross-border Payments: Stage 3 Roadmap*, October.

Financial Stability Board (2023), *G20 Roadmap for Enhancing Cross-border Payments: Consolidated progress report for 2023*, October.

Financial Supervisory Authority ('Finansinspektionen') (2024), 'Major banks need to rectify deficiencies in payments infrastructure', press release 20 June.

Frost, Jon, Priscilla Koo Wilkens, Anneke Kosse, Vatsala Shreeti and Carolina Velásquez (2024), 'Fast payments: design and adoption', *BIS Quarterly Review*, March, pp. 31–44.

Garner, Joe (2023), *Future of Payments Review 2023*, HM Treasury, November.

Ingves, Stefan, Eva Julin, Stefan Lindskog, Gabriel Söderberg and David Vestin (2022), 'What is money and what is the role of the state in the payments market?', *Sveriges Riksbank Economic Review*, no. 2, pp. 6–25.

Jordan, Thomas J. (2024), 'Project Helvetia III – The SNB's pilot for wholesale CBDC', speech at BIS Innovation Summit, Basel 6–8 May, Swiss National Bank.

Neuhaus, Holger and Mirjam Plooij (2023), 'Central bank money settlement of wholesale transactions in the face of technological innovation', *ECB Economic Bulletin*, no. 8, European Central Bank, pp. 96–109.

Noll, Franklin (2024), 'Observations from the Retail CBDCs of the Caribbean', *Payments System Research Briefing*, Federal Reserve Bank of Kansas City.

Reserve Bank of Australia and DFCRC (2023), *Australian CBDC Pilot for Digital Finance Innovation: Project Report*, August.

Sveriges Riksbank (2024), *E-krona pilot Phase 4*, E-krona report, March.

The Regulated Liability Network (2022), *The Regulated Liability Network: Digital Sovereign Currency*, November.