

Exploring longer operating hours for RTGS

Discussion paper

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As part of the [Future Roadmap for the Real-Time Gross Settlement \(RTGS\) service](#), the Bank of England announced plans to initiate a process of industry co-creation to explore the business cases for identified priority features, including extended RTGS operating hours. This discussion paper, which builds on industry feedback to date, outlines the Bank's initial analysis on the benefits and costs of extended hours (including to near 24x7) and seeks feedback to input to a decision on future operating hours.

This discussion paper is published alongside a companion paper on [access to RTGS settlement accounts and services](#).

Responding to this discussion paper

Why we are issuing this discussion paper

Three key factors motivate the Bank's decision to review RTGS operating hours: (i) supporting the Bank's strategy to facilitate sustainable innovation in the UK financial system, (ii) helping to address frictions currently affecting cross-border payments, and (iii) leveraging the technical capabilities of our renewed RTGS service.

This discussion paper seeks views on the potential benefits, costs and impacts an extension of RTGS operating hours could create. We want to gain insights from a broader range of stakeholders, to strengthen our initial analysis based on industry feedback and international experience, ahead of forming a proposal on future operating hours and the path to getting there.

Who we would like to hear from

We would like to hear from a wide range of existing and future users of the RTGS service as well as other stakeholders. This includes banks and building societies, the wider payments industry, technology providers, payment users, financial institutions, trade associations, academics, other central banks and public authorities.

Who in your organisation should respond

Responses should include collated views from people with a broad, strategic view of their organisation's future priorities and how RTGS can support them, including colleagues working on operations and change projects to discuss costs and complexity.

When we need responses by and how to respond

We would be grateful for responses to this consultation by 30 April 2024. [Please respond to the consultation via this link](#) . If you have any questions about this consultation, please email  RTGSRoadmap@bankofengland.co.uk.

It is possible that some questions will not be relevant to your organisation. In particular, the questions on potential implementation options in Section 5 (Questions 6–14) are largely only relevant to current or prospective RTGS participants. Nevertheless, please try to answer as many questions as possible and share any views you have. We are interested in gathering as much relevant feedback as possible to understand industry viewpoints.

Please indicate in your response if you believe any of the sections in this discussion paper are likely to impact persons who share protected characteristics under the Equality Act 2010, and if so, please explain which groups and what the impact on such groups might be.

Please see the [Bank's privacy notice](#) and the [RCEP privacy notice](#)  which set out how we handle personal data in the performance of our functions.

Next steps


We will continue to engage with a range of stakeholders as we analyse future RTGS and CHAPS operating hours. This includes through the co-creation process, workshops, events, and other bilateral and multilateral discussions.

We will issue a consultation paper in 2025 to formally consult on a proposal for RTGS and CHAPS operating hours. This will include a proposal on the end-state for future operating hours and an implementation path to reach that goal. After assessing the consultation feedback, the Bank will communicate a decision on operating hours.

If an extension is agreed, the Bank will work closely with industry to develop a roadmap for implementation. At a minimum, the Bank would give at least one year's notice before implementing any changes to RTGS operating hours. The specific implementation path will depend on the proposed length of extension – which could include multiple stages.

Foreword

The payment landscape continues to change rapidly because of shifts in customer demand and new technology developments, and the Bank of England has been evolving its policies and practices in line with these changes.

The way users transact continues to evolve. There has been a decisive move towards card, mobile, and electronic payments and an increasing trend towards always-on, real-time retail and wholesale transactions. This change is not just about technology but a fundamental shift in user behaviour and preferences. Customers expect financial transactions to keep pace with the speed of digital communication. The flow of payments has also changed. Cross-border payments continue to increase in value and importance in an ever more interconnected, global digital economy, and the [G20 has placed great importance on enhancing them](#) . And technology is pushing the boundaries of automation, allowing for processes that were once manual and time-bound to be conducted efficiently and continuously.

RTGS is at the heart of the UK payments industry through its provision of settlement in central bank money – the safest form of money. Our vision is for RTGS to act as an open platform for change and innovation, supporting the Bank’s financial stability and monetary policy objectives. This platform should drive improvement in wholesale settlement efficiency and foster an ecosystem which encourages competition between firms while minimising credit and operational risk. Ultimately, we want to support the development by industry of innovative features which would lead to cheaper, safer and faster domestic and cross-border payments.

RTGS is currently being renewed to respond to the changing payment landscape and industry feedback. We have already introduced ISO20022 for CHAPS, and this year will introduce the new core settlement engine – delivering a more resilient, flexible and innovative sterling settlement system to support monetary and financial stability. The renewed RTGS service will benefit the industry across four key areas: increased resilience, greater access, wider interoperability and improved user functionality. It will also support extended hours, with no technical barriers to moving to a near 24x7 operation in the future.

In February 2023, following industry consultation we published a [Future Roadmap for RTGS](#). This sets out our vision to enhance RTGS services after 2024 to increase resilience and deliver further innovation. One of the priorities identified was to conduct a full review of extended RTGS and CHAPS operating hours – co-creating proposals with users.

We have started this review, after establishing a thematic engagement group (co-creation group) of 25 organisations representative of the UK payment landscape in May 2023. Through this initial engagement we have started identifying the use cases, benefits, costs, and impacts of extending operating hours, as well as scoping the questions we need to answer to decide future RTGS and CHAPS operating hours.

This discussion paper summarises the findings from these discussions combined with our internal analysis. Given the wide-ranging impacts of an extension of RTGS operating hours, we want to gather feedback from a broad range of stakeholders ahead of forming a proposal on future operating hours and the path to getting there.

Victoria Cleland, Executive Director for Payments


Executive summary

This discussion paper outlines initial findings from the Bank’s assessment of the potential benefits and costs of extending operating hours for RTGS, the UK’s settlement service infrastructure, and CHAPS, the UK’s high-value payment system. The analysis has benefited from ongoing discussions with industry and the international community. This discussion paper seeks views from a wider group of stakeholders on the impacts of extending operating hours and the various implementation options to do so.



Extending hours could **improve domestic payments and reduce risk in the financial system**. It would enable additional settlement of payment obligations, ultimately reducing settlement and credit risk (for uncollateralised transactions) or reducing liquidity cost (for collateralised transactions).



Extending hours would help to **enhance cross-border payments**, a G20 priority. As per the recent [CPMI report on extending and aligning payment system operating hours](#) , the more systems globally are open simultaneously for cross-border payment settlement, the faster (and potentially cheaper and safer) payments are able to complete.



Extending hours would help to **facilitate innovation and competition** in the evolving payments market. It would facilitate greater efficiency and reduce risk by allowing new innovations such as central bank digital currency (CBDC), systemic stablecoins and tokenised deposits to integrate central bank money more seamlessly in their solution. Longer hours is also a key enabler to certain innovations that could benefit UK and global payments – such as synchronisation (see Section 3.1), interlinking of payment systems, and Payment versus Payment (PvP) settlement.



Extending hours would create **material costs** for payment system operators and participants to upgrade technologies and infrastructure, amend business operations, and retain, attract and train staff. In the longer term the potential automation that could result from these upgrades may lead to future reductions in operating costs.



Extending hours could create **operational risks that would need to be managed** – for example resulting from the challenge of operating with a reduced downtime window during which system maintenance and upgrades generally occur.

In this discussion paper we encourage respondents to think strategically for what might be required roughly 10 years from now, and how advantageous near 24x7 could be. We want to understand what actions would be needed – by the Bank of England (as RTGS and CHAPS

operator, participant, and policymaker), RTGS users, and other public and private sector organisations – to extend to near 24x7.

If we decide to extend by any significant length, our primary expectation is that we would adopt a staggered approach, with clear milestones to support budgeting and planning. A working approach might be to open RTGS and CHAPS earlier in the morning for settlement (eg moving from 06:00 to 01:00) and to extend the window for contingency extensions to later in the evening (eg from 20:00 to 23:00) as a first step. This would help to enhance cross-border payments by increasing overlap with the European and Asia-Pacific time zones.

Work to review operating hours is at an early stage and **the Bank has not made any decision on future RTGS and CHAPS operating hours**. This discussion paper aims to be the basis for further research and dialogue between the Bank, the payments industry, technology providers, payments users, financial institutions, academics, other central banks, and public authorities. We encourage anyone with an interest in these issues to respond.

Feedback received through this discussion paper and other outreach programmes will strengthen initial analysis and input to the Bank's decision on future RTGS and CHAPS operating hours. It will help to inform our understanding of the demand for an extension and the costs involved, including an assessment of whether near 24x7 is desirable and if so under what implementation path. Overall, in making a decision on future RTGS operating hours we will consider industry demand and public policy objectives and will aim to balance long-term strategic needs with potential costs and risks. In choosing any implementation path we will be mindful of other ongoing initiatives which draw on similar resources

1: Introduction: RTGS

As settlement agent for the main sterling payment systems, the Bank of England operates the UK's RTGS service. This infrastructure performs two key functions for enabling settlement in central bank money, which offers the lowest-risk way for financial institutions to meet payment and settlement obligations:

1. **RTGS enables the settlement of wholesale obligations**, ie large-value and time sensitive financial transactions between financial institutions, corporations, and government entities going **through CHAPS**,^[1] **CREST**^[2] and **CLS**.^[3] RTGS allows these critical transactions to settle safely and rapidly, a key contribution to financial stability. For these systems to settle, RTGS must be open.
2. **RTGS enables the settlement of the net obligations of seven retail payment systems** ^[4] **at fixed points each day**. The processing of individual retail payments takes place in other infrastructures and so can occur outside of RTGS operating hours – in some cases 24x7. However, RTGS needs to be open to periodically settle the net obligations that arise from customer transactions.

As well as providing settlement services, RTGS plays an important part in how the Bank implements monetary policy decisions. Reserves accounts are sterling-denominated instant access accounts offered to eligible financial firms that are held in RTGS. Reserves accounts are a vital tool for implementing monetary policy since we remunerate reserve balances at Bank Rate, which is set by the Monetary Policy Committee.

RTGS is currently open for settlement from 06:00 to 18:00 on business days. This has been the case since 2016, when the Bank **extended operations by around two hours in the evening** to enable a longer CHAPS and CREST settlement day. This change enabled the UK high-value payment and securities settlement day to align with typical business hours. As a result, end-users of CHAPS and CREST have since been able to settle transactions later in their business day, enabling them to reduce risks or manage their balance sheets and payments more flexibly.

This settlement period is the key window which we refer to when considering 'RTGS operating hours'. Technically, RTGS does 'operate' longer than this. RTGS's core system is currently open for certain functions – such as balance and other enquiries and own account transfers – from 05:15 to 19:00, and it has an additional contingency settlement window as required until around 20:00. For further information, please see the **brief introduction to RTGS and CHAPS** and the **RTGS daily timetable**.

The Bank is undergoing a transformational programme to deliver a renewed RTGS service that is more resilient, flexible and innovative. Our vision is for RTGS to act as an open platform for change and innovation, supporting the Bank's financial stability and monetary policy objectives. This platform should drive improvement in wholesale settlement efficiency and foster an ecosystem which encourages competition between firms while minimising credit and operational risk. Ultimately, we want to support the development by industry of innovative features which would lead to cheaper, safer and faster domestic and cross-border payments.

The Bank will deliver a number of enhancements with the new RTGS core settlement engine go live in 2024. As per the 2017 blueprint, the renewed RTGS will have the capability from the outset to operate for a longer operational period (at least 22 hours) on current business days. The precise nature of what can be done during this time will be confirmed with participants. It will also have no technical barriers to operate near 24 hours, seven days a week if desired. This recognises the long-standing demand from industry for the capability to extend operating hours if/when required. Understanding the case to use this capability and extend the settlement window is the purpose of this review, which will consider industry demand and public policy objectives.

Figure 1: UK RTGS operating hours



Note: Lighter shades represent contingency extension.

2: Drivers and scope of this review

2.1: Drivers to review RTGS operating hours

Since we last extended hours in 2016, much has changed in the payments landscape. People increasingly use card, mobile and electronic payments, and the use of faster payments has increased significantly. Cross-border payment values continue to grow in an ever more interconnected, global digital economy and the [G20 have placed great importance on enhancing them](#) [↗]. There has also been rapid innovation with new players in the market and the development of new payment technologies, and also upgrades to existing retail and wholesale payments infrastructure in the UK and overseas.

To ensure that the UK payments infrastructure keeps pace with the changing world there may now be a greater case for:

- **Longer RTGS operating hours:** to offer an extended settlement window in central bank money for payment systems operated by external institutions currently settling in RTGS, such as CREST and the seven retail payment systems, and also payment systems that might settle in RTGS in the future (systemic stablecoin operators, synchronisation operators, etc).
- **Longer CHAPS operating hours:** to offer longer settlement hours for high-value and time-critical transactions. Extending CHAPS operating hours requires extending RTGS operating hours, but if we extend RTGS operating hours we do not need to increase CHAPS hours at all or by the same amount.

In order to respond to these changes, the Bank would like to continue to work with industry to review the case for extending RTGS and CHAPS operating hours. There are three main drivers for this review:

1. Addressing some of the frictions currently affecting cross-border payments.

- Cross-border payment values continue to grow in an ever more interconnected, global digital economy. Enhancing cross-border payments is a G20 priority, with clear [quantitative targets](#) [↗] and an actionable [Roadmap](#) [↗] to deliver faster, cheaper, more accessible and transparent cross-border payments by 2027.
- The Bank is a keen supporter of the initiative and contributes to work to drive forward the Roadmap, now focused on a set of [priority actions](#) [↗]. These consist of practical improvements that are foundational to removing frictions in the market – including extending and aligning RTGS operating hours.

- A lack of overlap in key payment system operating hours across countries and the outdated technology relied upon are some of the key factors limiting cross-border payments. As per the Committee on Payments and Market Infrastructures (CPMI) [report](#), updating systems and extending operating hours could speed up cross-border payments, improve liquidity management, reduce settlement risk and enhance the performance of ancillary payment systems that may be used for cross-border payments.
- Countries worldwide are adopting extended RTGS operating hours, recognising the benefits of coordinated action. Countries such as India, Mexico, Oman South Africa, Switzerland, and Tanzania are already operating 24x7 or near 24x7. The ECB moved to earlier RTGS opening in March 2023 (from 08:00 to 02:30 CET). Even more jurisdictions are reviewing hours, as per the [CPMI's recommendation](#).

2. Leveraging the renewed technical capabilities of our new RTGS service.

- The new RTGS service will be able to support extended hours, with no technical barriers to near 24x7 operation. This was done to ensure that there is flexibility to change the operating hours in the future in light of user demand and public policy objectives, recognising the potential benefits of operating longer. We are now in a position to be able to implement longer hours, if desired.

3. Supporting the Bank's strategy to facilitate sustainable innovation in the UK financial system, especially regarding wholesale settlement, which is key to maintaining monetary and financial stability.

- The payment landscape is undergoing a profound transformation driven by innovation and the introduction of new digital money. These new innovations – such as central bank digital currency (CBDC), systemic stablecoins, and tokenised deposits, which may be available round the clock – are designed to meet the needs of an increasingly digital economy.
- Longer RTGS operating hours would facilitate greater efficiency and reduce risk by allowing these innovations to integrate central bank money more seamlessly in their solutions (especially if they are required to back their issuance with central bank deposits).
- In addition, there are several other innovations that could provide benefits to the payments market and UK financial stability which longer operating hours could help to enable. Examples include: (i) synchronisation, which is a service the Bank is considering to allow a wider range of ledgers to connect to RTGS and which could reduce frictions and costs; (ii) interlinking of payment systems, which can shorten transaction chains, reduce overall costs, and increase the transparency and speed of cross-border payments; and (iii) PvP settlement, which eliminates settlement risk for foreign exchange transactions.

The review will incorporate feedback from a wide range of stakeholders. We will continue to engage bilaterally and multilaterally with key stakeholders, for example through newly created ‘industry co-creation groups’ (introduced in the [response to the Roadmap for RTGS beyond 2024 consultation](#)). We will also continue to engage with our international community, for example through the initiatives set up under the G20 cross-border payments programme such as the [central bank community of practice](#) [↗](#) and the [payments interoperability and extension task force](#) [↗](#). Finally, we will continue to report on our current thinking and seek written feedback through discussion and consultation papers.

2.2: Scope of the analysis

Operating times

The review’s analysis primarily focuses on an extension of RTGS and CHAPS to near 24x7 (see Box A). This is the most future-looking end-state with the most wide-ranging implications. Undertaking the review in this way comprehensively captures all potential impacts and allows us to understand in full the potential barriers and possibilities of any potential end-state. We want to understand what actions would be needed – by the Bank of England (as RTGS operator, participant and policymaker), other RTGS participants, and other public and private sector participants – to make near 24x7 possible.

24x7 is not the only option and **no decision has been made on whether, when or by how much the Bank would extend operating hours**. To do so, we will consider the full range of potential benefits and costs of extending operating hours, including impacts on the Bank, industry participants, end-users, the wider UK economy and public policy objectives. This will help us to establish a forward-looking strategic roadmap that balances current demand and the evolving payment needs of an increasingly digital economy.

Systems

The Bank sets the operating timetable of the RTGS infrastructure. The RTGS timetable does not specifically determine the hours that sterling payment and securities obligations are settled by each system. Consequently, extending RTGS operating hours is a necessary, but not sufficient, condition for extending the hours for payments to settle in central bank money in RTGS.

The review’s analysis primarily focuses on an extension of RTGS and CHAPS operating hours – which the Bank controls, but whose impacts are wide. RTGS is a core ledger and settlement engine which relies on many related systems interacting to facilitate payment and settlement. To consider the full range of impacts to the payment and settlement landscape, it is necessary to also consider the impact of changes to other financial market infrastructures – such as CREST and retail payment systems – that are operated by other key stakeholders.

Services and optionality

There are many different models for operating longer hours, including near 24x7. We want to consider the full range of approaches, including for example by considering what services we could offer in any additional hours, how different participants are expected to engage with the extended hours, and whether we could incorporate any optionality.

The review will also consider the need for changes to the hours during which the Bank of England supplies liquidity facilities. Access to the Bank's Sterling Monetary Framework (SMF) is an important tool for CHAPS Direct Participants and CREST Settlement Banks to be able to manage their liquidity. The Bank will consider the extent to which it would extend the availability of certain SMF facilities to reflect any extension of RTGS operating hours.

Box A: What does 'near 24x7' mean?

By 'near 24x7' we mean operating typically seven days a week, at least 23 hours a day. We consider that some downtime – to be determined, but likely around 30 minutes – would be helpful to carry out maintenance and testing or onboard new participants. This approach is in line with other countries that operate longer hours.

For example, in the **Swiss Interbank Clearing (SIC) system** [↗](#) – the RTGS system in Switzerland – participants can enter payment orders around the clock, but payments are processed for approximately 23 hours. There is a 45-minute window when the system does not process payments to allow for end of day processes to occur.

In the SIC system, a settlement day starts at approximately 19:00 on the previous calendar day and ends in three stages:

- Stage 1: 17:00 is the cut-off time for payments to be entered by a participant and settled on the same value date. From this moment on, payments submitted for same day settlement are automatically changed to the value of the next business day.
- Stage 2: Compensation payments can be submitted for same-day settlement between 17:00 and 18:00. Compensation payments are bank-to-bank payments that are made in the name and on account of the bank issuing the transfer order. The reason for such payments may, for instance, be money market transactions. Consequently, the window between 17:00 and 18:00 allows those participants whose payment could not be fully processed to procure the necessary liquidity on the money market.
- Stage 3: Between 18:00 and 18:15, counterparties can obtain liquidity from the Swiss National Bank under the liquidity-shortage financing facility.

The value day ends at 18:15, after which the end of day processing sets in and the system transfers the balance from the SIC settlement account to the sight deposit account.^[5] All queued payments are deleted and must be resubmitted the next day. The next value date begins at approximately 19:00.

3: Benefits and use cases of an extension

Extending RTGS and CHAPS operating hours, in particular to near 24x7, could have several benefits for individual consumers, businesses, banks, other financial institutions, and financial market infrastructures in the UK and abroad. It is crucial to ensure our payment and settlement infrastructure keeps pace with the changing world, including by offering a highly resilient settlement service in central bank money which is fit for purpose. We aim for RTGS to encourage innovation and competition, while minimising systemic and financial stability risk. In time, near 24x7 operation may be necessary to achieve this.

This section outlines some of the key benefits and use cases of extending RTGS operating hours. We are keen to understand further the extent to which these benefits could materialise for different extension types, the key stakeholders that could experience the benefits and how, and whether there are further benefits we have not yet identified. To decide on future operating hours, we will need to analyse these benefits against the corresponding costs/risks.

3.1: Benefits of extended hours

Improving domestic payments and safeguarding financial stability


Longer operating hours could help to improve liquidity management and reduce settlement risk. It would enable net settlement of retail payment obligations overnight and at the weekend, ultimately reducing settlement and credit risk (for uncollateralised transactions) or reducing liquidity cost (for collateralised transactions).

Most sterling electronic payments (by volume) are ultimately settled through RTGS using net settlement. Net settlement systems operate in regular (eg one or more a day) settlement cycles. At the end of each cycle the operator calculates each settlement participant's obligations on multilateral net basis, so that each settlement participant either owes or is owed a single, netted, value. The operator then sends instructions to the Bank to settle the obligations. The current norm in the UK is for this settlement to take place after information is exchanged on individual payments, and after customers are debited/credited ie deferred net settlement. The lag between payment exchange and participant's obligations being sent to RTGS for settlement varies. For example, between some Faster Payments Service (FPS) settlement the lag is four hours, whereas Bacs operates on a three-day cycle.

During this time, if settlement is uncollateralised in RTGS (eg payments via LINK, Mastercard and Visa), payment providers may be exposed to settlement risk; although this may be mitigated by other arrangements outside RTGS. Longer RTGS operating hours would enable additional points of net settlement during new times/days, thereby potentially reducing financial risk exposures.

The settlement risk can be eliminated using prefunding accounts – which are used for Bacs, FPS and the cheque-based Image Clearing System, all operated by Pay.UK. This requires settlement participants to hold segregated liquidity to cover exposures in the relevant retail payment system, which comes with an opportunity cost. Longer operating hours could reduce the liquidity cost of retail settlement.

As part of its full analysis, the Bank will consider whether there are opportunities to meaningfully support the reduction of settlement risk and/or liquidity requirements set by the payment system operators by redesigning the frequency and timing of net settlement, which could be a reasonable driver for changing RTGS operating hours.

In addition, longer RTGS operating hours would enable economic agents to settle high-value real economy retail payments (settled in CHAPS in real time) during new hours/days. If participants in the payment chain (eg financial institutions, conveyancers) opted to use these new times, it could help to speed up house purchases and corporate payments. In addition, the new times could help to spread the volume of payments in CHAPS and reduce the operational risk linked to settlement concentrated between 06:00 and 18:00. It could also maximise the benefits of forward dated payment functionality which is being delivered in the renewed RTGS service, and help to optimise the use of the [Liquidity Saving Mechanism](#) .

More generally, upgrading infrastructure to enable extended operating hours could provide an opportunity for wider operational risk management enhancements such as a reduction in manual process risks from greater automation. While RTGS Renewal already embeds these resiliency measures for RTGS itself, an extension of operating hours would require changes to several other payment and settlement systems – within the Bank and externally – that could benefit from this opportunity to deliver operational risk enhancements.

Enhancing cross-border payments

Longer UK RTGS operating hours would increase overlap with other RTGS and wholesale payment systems and help to reduce frictions for cross-border payments. It would directly increase speed and also facilitate other innovations such as liquidity bridges, interlinking and PVP. Faster cross-border payments would aid people and businesses, improve liquidity management,

reduce settlement risk, and more generally support international trade, economic growth, global development and financial inclusion.

The G20 have made it a priority to improve the speed, cost, accessibility, and transparency of cross-border payments. They have set clear quantitative targets, including for 75% of payments to be completed within one hour and 100% of payments within one working day by 2027. As per the Financial Stability Board's (FSB's) [latest monitoring report](#) [↗], globally we are significantly short of the targets and action will be needed to close the gap.

In the UK, cross-border payments are typically sent via CHAPS and therefore settled in RTGS. As such, CHAPS and RTGS operating hours determine the times when cross-border payments can be initiated, cleared, and settled, ultimately causing delays for end-users. The delays are exacerbated in an international setting due to a lack of overlap in operating hours across jurisdictions, particularly those located in different time zones.

As part of the G20 programme to enhance cross-border payments, the [CPMI undertook a survey on RTGS operating hours](#) [↗] across 82 jurisdictions. This informed analysis on the benefits, risks, challenges, and policy considerations of extending key payment system operating hours, and principally how this could help to enhance cross-border payments.

The survey revealed that on average RTGS systems are open for almost 11 hours per working day, but there is substantial variation across jurisdictions. Relatively few jurisdictions have an operating window on weekends – eight jurisdictions operate on a weekend, five of which operate seven days per week. The UK's operating window is longer than average, but shorter than many advanced economies – for example Switzerland's RTGS operates for 23.5 hours a day, the US for 22 hours, and Australia for 14.5 hours. Due to the UK's central time zone, its operating window overlaps by at least three hours with most other countries.

Certain cross-border payments face significant delays due to a lack of alignment between RTGS operating hours. For example, a payment from Australia to the UK sent at 11:00 GMT would be delayed by 19 hours (9.5 hours waiting for Australia's RTGS to open at 20:30, followed by a further 9.5 hours waiting for the UK's RTGS to open at 06:00). Payments between other countries (eg Brazil and Korea) face delays up to 26 hours on working days.

The Bank has developed a simple model exploring the delays to cross-border payments caused by the lack of overlap in RTGS operating hours across G20 country corridors – and the potential improvements that could be gained from the UK extending hours. See Box B.

The analysis indicates that payments sent to and from the UK on working days face delays of around 4 hours on average due to RTGS closures alone. Delays range from 0 to 21 hours – with payments initiated later in the day (ie past 18:00 GMT) and with countries in different

time zones (in particular Asia-Pacific (APAC)) facing the most substantial delays. The model suggests that, given current RTGS hours, even on working days only around 50% of UK payments could complete within the FSB's one-hour target – and that is without considering other delays, for example from anti-money launders checks. On non-working days delays could reach three days.

The model explores the impact of changes to operating hours. It demonstrates clear benefits (reduced payments delays) from the UK extending operating hours. It predicts that:

- The first five hours of extension generates the greatest marginal benefit for the UK, after which point benefits are positive but diminishing.
- For extensions up to five hours, opening earlier in the morning creates a greater marginal benefit than closing later in the evening. This is largely due to the potential to increase overlap with APAC countries.
- Extending by five hours into the morning would reduce payment delays to/from the UK by roughly 6% and increase the proportion of payments that can complete within the one-hour target from around 50% to 60%.
- Extending to 24 hours a day would reduce average payments delays to/from the UK by around 60% and increase the proportion of payments able to complete within the one-hour target to around 75%.

Ensuring that RTGS remains at the forefront of technological innovation and supports the changing needs of industry

The Bank of England is committed to innovating our payments infrastructure to ensure it remains resilient and relevant in light of changing technology, financial system developments and public needs. RTGS is at the heart of UK payments – it enables safe and efficient settlement in central bank money. We must ensure it is fit for the future.

Longer RTGS operating hours could be an important enabler for the safe adoption of future innovations – such as synchronisation, interlinking, PVP settlement of foreign exchange (FX) transactions, systemic stablecoins and CBDCs.

The global digital economy is increasingly trending toward always-on, real-time retail and wholesale transactions. Future innovations (eg assets tokenisation, Faster Payment System interlinking, systemic stablecoins, CBDCs) and changes to regulation (eg HM Treasury digital securities sandbox) might speed up the creation of new payment services that would benefit

from longer operating hours. As highlighted by [Andrew Bailey's July 2023 Mansion House speech](#), it is essential that safe and efficient settlement in central bank money remains an attractive feature in any future shift of the payment landscape – and RTGS Renewal is pivotal in enabling innovation and delivering solutions which can integrate central bank digital money in RTGS with tokenised transactions.

Synchronisation

'Synchronisation' is a generic interface into RTGS which would allow a wider range of ledgers, including those using distributed ledger technologies, to connect to RTGS to synchronise transactions and to enable 'atomic settlement'. In atomic (or conditional) settlement, the transfer of two assets is linked in a way that one asset moves if and only if the other asset moves. The synchronisation service would be provided by 'synchronisation operators', a new type of RTGS participant that would "orchestrate" the settlement, including the earmarking and releasing of funds in RTGS accounts.

Synchronisation is one of the priority features the Bank is exploring as part of our Future Roadmap for RTGS beyond 2024. Industry has indicated **strong demand for synchronisation functionality and highlighted a number of benefits** [↗](#) it could provide.

Firms have indicated that there are current processes where synchronisation could offer a reduction in frictions and costs – including reducing intraday exposure in securities markets, addressing the risk and cost associated with housing transactions and reducing liquidity inefficiencies associated with prefunding during corporate actions. The functionality could offer RTGS participants, service providers and end-users the potential for a significant reduction in such risks as well as greater speed, efficiency, and transparency of settlement.

Longer RTGS operating hours is an important enabler for synchronisation. RTGS will need to be open for the checking of balances, earmarking of funds in settlement accounts held in RTGS, and the final movement of funds. The longer RTGS is open, the longer the time window in which synchronisation can occur and the highlighted benefits can be enhanced.

Interlinking

Alongside extending and aligning payment system operating hours, interlinking payment systems across borders is another **priority action** in the **G20 Roadmap to enhance cross-border payments**. Interlinking arrangements can shorten transaction chains, reduce overall costs, and increase the transparency and speed of payments. Several projects are currently under way to interlink Fast Payment Systems across countries (see Box 2 of the FSB's **2023 Progress report** [↗](#)).

Greater overlap of operating hours across systems could allow interlinking arrangements to operate over prolonged time windows, which could facilitate timely settlement of a greater volume of transactions and mitigate operational risks stemming from the difficulty of managing incidents in a limited timeframe. With regards to interlinking FPS systems that operate 24x7, a greater overlap of RTGS operating hours can support liquidity management.

Payment versus Payment (PvP) settlement

Facilitating the increased adoption of PvP is another of the actions identified by the G20 to enhance cross-border payments. PvP eliminates settlement risk for FX transactions because it creates simultaneous exchange of currency ownership, providing the assurance that one party continues to own their funds until their counterparty has met transfer obligations. It could also substantially reduce funding costs for cross-border payments by offering functionalities such as netting to reduce participant liquidity obligations.

As highlighted in the [Bank for International Settlements consultative report on PvP](#), currently many deliverable FX trades are not settled using PvP and the proportion of non-PvP settlement has increased since the early 2000s. There are several reasons for this, including the technical challenges for PvP providers to access and interoperate with RTGS systems during operating hours that meet user demands.

Systemic stablecoins

Stablecoins have the potential to be used for everyday payments. It is important that this innovation can be adopted safely.

As set out in [the Bank's proposed regulatory framework for systemic payment systems using stablecoins](#), it is proposed that issuers would be required to fully back stablecoins with central bank deposits at the Bank of England. This would aim to ensure that the stablecoins maintain their value and can be used for payments with full confidence. To do so, issuers would need an account at the Bank of England. This account will not support out of hours fund transfers from RTGS, and as such stablecoin providers will need to appropriately manage risks that occur while stablecoin systems are open (likely 24x7) and RTGS is closed. In other words, stablecoin providers will need to hold appropriate accessible liquidity such that coinholders are able to redeem the stablecoins at par in fiat money at all times.

Longer RTGS operating hours would reduce liquidity risks from the mismatch in stablecoin system and RTGS operating hours. If RTGS were to move to 24x7 operations, this liquidity risk would be eliminated as providers could access the central bank deposits backing the stablecoins at all times.

CBDCs

As set out in the [2023 digital pound consultation paper](#) and corresponding [response paper](#), the Bank is looking at the idea of a retail CBDC or 'digital pound'. There are many potential motivations for a 'digital pound' – including to support innovation and choice – and the Bank and HM Treasury judge it likely that one will be needed in the future, as the payments landscape evolves. That said no decision regarding a digital pound has yet been made.

Extended RTGS hours could help the functioning of a CBDC. A working CBDC settling central bank money is likely to need interfaces to enable transfers between RTGS accounts and CBDC accounts – which may be desired 24x7. The ability to settle transactions over weekends could support usability for individuals and businesses and could reduce the liquidity impact of CBDC on RTGS participants.

Supporting the UK economy and public policy objectives

An extension of UK operating hours could support the UK economy and its public policy objectives. Some of these benefits overlap with those discussed in other sections – for example the benefits to cross-border payments supports the G20 priority initiative to enhance cross-border payments, which the Bank of England is committed to supporting. The potential benefits for UK financial stability are of course a key priority for the Bank of England.

In addition to these specific benefits, increasing RTGS operating hours might help to increase accessibility to the UK economy and currency. GBP is the fourth most traded currency (13% of all the trading in over-the-counter FX markets in 2022). Extending RTGS operating hours would not only facilitate operations but also potentially allow for an extension to trading hours for FX and securities markets in the future. This would contribute to maintaining sterling's position as a currency of choice for global trades. It would also ensure that sterling remains attractive for any future innovation in providing PvP settlement of FX transactions.

3.2: Use cases of extended hours

There are many potential use cases for longer RTGS operating hours, depending on the extension type. Extending into the morning facilitates greater overlap with EU and APAC countries and could reduce operational burdens by smoothing domestic settlement flows. Extending into the evening facilitates greater overlap with North and South American countries and could benefit the housing market and security settlement. Extending into the weekend would enable greater overlap with countries with different operating days – eg in the Middle East – and could benefit the housing market, innovation, liquidity and settlement risk.

Figure 2 illustrates some of the different use cases of extending operating hours.

Figure 2: Use cases of extending RTGS and CHAPS operating hours

Time (GMT)	CHAPS cross-border	CHAPS domestic (wholesale/high-value)	Non-CHAPS domestic (retail)	CREST
Extend am 0	Facilitate faster cross-border payments with EU and APAC countries due to greater overlap with other RTGS systems	Reduce the current peak in volume and value at start of day by distributing the volume of non-critical payments through the overnight period. Provide corporate treasurers with earlier information on available daily liquidity	More frequent settlements could reduce liquidity impact	
1				
2				
3				
4				
5				
6-18	Current RTGS and CHAPS operating hours, with contingency operating hours up to 8pm			
Extend pm 19	Facilitate faster cross-border payments with North and South American countries	Property completion later on peak volume days		Facilitate securities settlement
20				
21				
22				
23				
Weekend Saturday		Enable property completion on weekends. Support usability of stablecoin/CBDC and reduce liquidity impact on weekends	Reduce build-up of settlement risk on weekends and liquidity impact on Monday	
Weekend Sunday	Facilitate faster cross-border payments with Middle Eastern countries			

Questions

Q1: What do you see as the key benefits for extending RTGS and CHAPS operating hours for (a) your organisation and (b) the UK or global financial system? In your response, please consider whether an extension of RTGS alone or RTGS and CHAPS together would be most helpful.

Q2: What operating hours of RTGS and CHAPS would best achieve these benefits? Note that RTGS and CHAPS can have different operating hours.

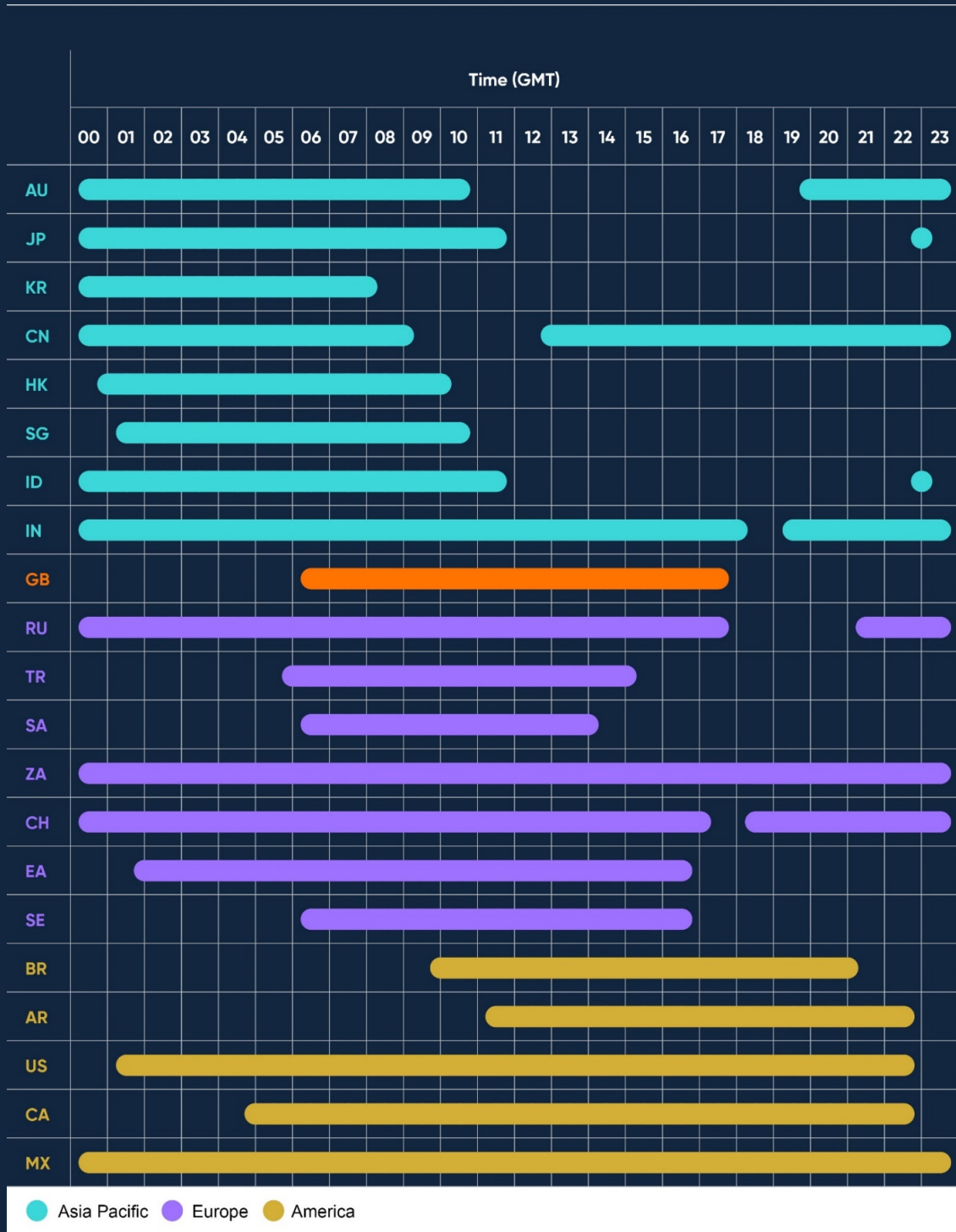
Q3: In your opinion, are there any compelling reasons that would suggest that near 24x7 settlement in RTGS should not be an aspiration over the next 10 years?

Box B: Simplified model of delays to cross-border payment speed caused by the lack of overlap in RTGS operating hours across jurisdictions

- The Bank's simplified model is designed to analyse the impact of extending operating hours on the speed of cross-border payments. It should not be taken as a full estimate of the speed of cross-border payments which face additional, potentially significant delays (for example from security checks or data constraints).
- Using data from the CPMI stocktake on current RTGS operating hours across jurisdictions, the model looks at delays to sending and receiving cross-border payments caused by a lack of overlap in RTGS operating hours alone for each payment corridor at each hour time interval.
- The model summarises average payment delays and the proportion of payments that could (with no further delays) meet the FSB's one hour speed target given current RTGS operating hours – for each country corridor and aggregated by country and globally.
- Due to current data availability the model makes several assumptions about the values/volumes of cross-border payments initiated throughout the day. Activity weightings for each country corridor are based on a proxy of [corridor-level trade flows data from the International Monetary Fund](#). For the timing distribution of payment initiation, the analysis has been repeated with two assumptions: (1) a uniform distribution throughout the day, and (2) the majority of payments (80%) initiated within 'sociable hours' (08:00 to 18:00 in the sending jurisdiction). The key conclusions are the same for both assumptions.
- The model only considers delays caused on current operating days. If the analysis were to include non-operating days, maximum and average delays would increase.

Figure A shows the RTGS operating hours across 21 CPMI jurisdictions, as per the [CPMI survey](#). It illustrates how far the UK currently overlaps with each country's hours – in other words showing how much of a difference it would make if the UK were to extend hours.

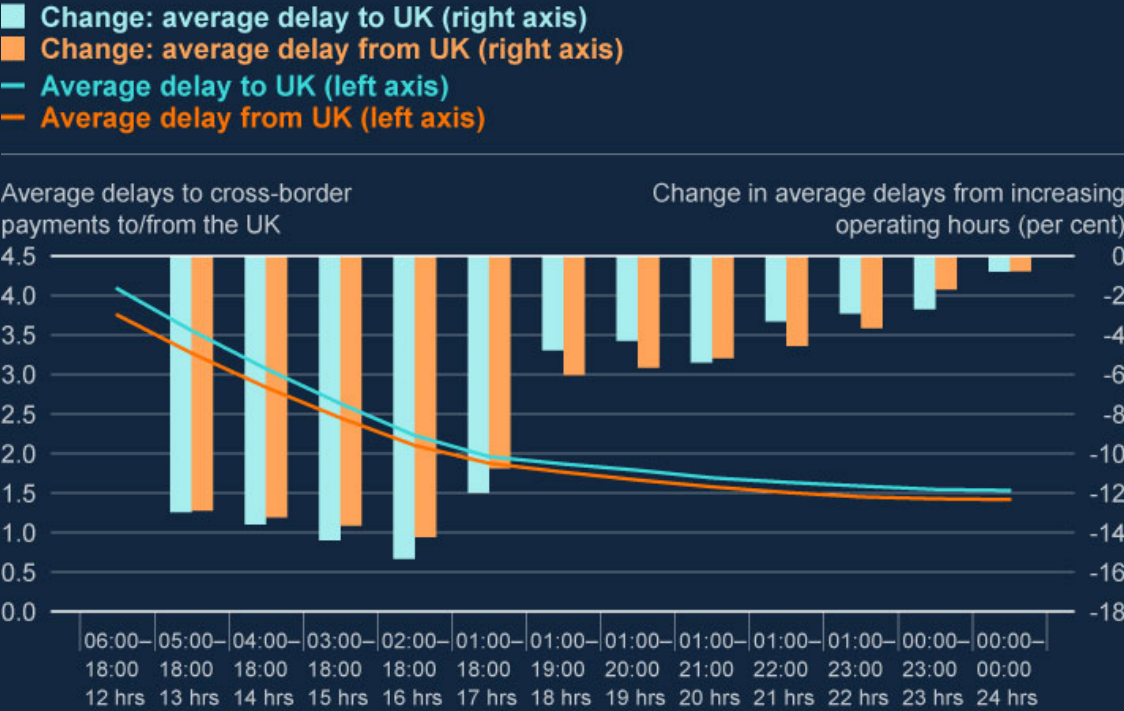
Figure A: International RTGS system operating hours, overlap with UK



Note: AR = Argentina; AU = Australia; BR = Brazil; CA = Canada; CH = Switzerland; CN = China; EA = euro area; GB = United Kingdom; HK = Hong Kong SAR; ID = Indonesia; IN = India; JP = Japan; KR = Korea; MX = Mexico; RU = Russia; SA = Saudi Arabia; SE = Sweden; SG = Singapore; TR = Turkey; US = United States; ZA = South Africa.

Chart A shows the impact of an increase in UK RTGS operating hours on the UK's average cross-border payment delays caused by RTGS systems being closed. For each additional hour, it shows the most positive impact – for example, if considering a one-hour extension from the current hours of 06:00–18:00, there is a greater benefit to extending into the morning than the evening, so the chart shows an extension to 05:00–18:00.

Chart A: Cross-border impact of extension to UK RTGS operating hours



4: Costs, risks and policy implications of an extension

The Bank recognises that extending RTGS and CHAPS operating hours would create various cost, risk and policy implications – not only for the Bank, but also for RTGS account holders, CHAPS indirect participants, financial market infrastructures (FMIs) that settle in RTGS, their participants, and other financial institutions. We also recognise that these impacts are likely to be greatest for an extension to near 24x7.

This section outlines some of the key cost, risk and policy implications of extending RTGS operating hours identified so far. We are keen to understand further the extent to which these impacts could materialise for different extension types and stakeholders, and whether there are further impacts we have not yet identified. To decide on future operating hours, we will need to analyse these costs/risks against the corresponding benefits.

4.1: Cost drivers for extended hours

Notable costs for payment system operators and participants include technology upgrades, changes to business operations, and increased staff costs, including in relation to recruitment, retention and training. We note that feedback so far has stressed that for some institutions costs would be significant for near 24x7 operations, which would require an overhaul of systems, models, processes and legal documentation – all with the aim of ensuring resilience and reducing operating risk. In contrast, an extension of a few hours would only require minor adjustments to staff, systems and processes for most of those organisations that have provided input so far.

Cost drivers may vary substantially between firms, largely driven by a firm's size, geographical reach (domestic or international) and the set-up of its systems. For example, small institutions may find it more difficult to absorb the costs of increasing their own hours relative to their business activity. From the feedback so far, we note relatively less demand from predominantly domestic focused firms which have highlighted substantial upfront and ongoing costs and limited benefits at this time.

Technology upgrades and changes to business operations

While the Bank will embed the technical capability for extended hours as part of RTGS Renewal, utilising this capability would require technical changes to RTGS infrastructure and the interrelated systems that connect with RTGS. This includes systems within the Bank and externally. Figure 3 illustrates the interlinkages between RTGS, CHAPS and FMIs. See [**A brief introduction to RTGS and CHAPS**](#) for further information.

Figure 3: Interlinkages between RTGS, CHAPS and FMI



The LINK ATM Scheme, Mastercard and Visa also settle through commercial settlement banks

→ SWIFT or other message → SWIFT messaging

- Financial institutions
- Recognised embedded payment system
- Recognised clearing house
- Settlement model
- Recognised payment system
- Service provider
- Unrecognised payment system

Work is already under way within the Bank of England to enact or understand the necessary changes to the Bank's externally facing – as well as internal – systems and operations, to enable longer RTGS operating hours:

- As set out in the RTGS Renewal blueprint, the renewed RTGS will be capable of extending the full range of services to 22x5 plus settlement windows on weekends and will have no technical obstacles to moving to near 24x7 operation. Several specific design features have already been embedded to the new underlying RTGS infrastructure to enable this – eg rolling upgrades, ability to patch/backup while the system is open, and largely automated start and end of day processes.
- Some further amendments would be required to RTGS and other related Bank of England systems to utilise the extended hours capability. At this stage, the Bank is working to understand the actions that would be required to ensure these systems are ready for any extension.

Other operators of relevant systems (eg RTGS participants and operators of other UK payment systems) should engage with this review to understand how their respective systems and operations would be impacted by an extension of RTGS operating hours, and what actions they would need to take to get systems ready for near 24x7. As and when operators routinely upgrade systems (some of which is already under way or planned), they could consider whether it could be appropriate to enable near 24x7 functionality.

From our engagement with industry so far, many RTGS participants have highlighted that they would have to significantly rebuild their systems to enable near 24x7 operations, as currently payments cannot be physically sent while certain processes or batch jobs are run, and key systems need to go offline for maintenance and testing. They have also flagged that changes would be needed to business operations related to payment activities and the policies and processes underpinning them. For example, changes would be needed to staffing policies, legal documentation, and compliance.

Staff-related costs

There could be implications for staff-related costs associated with extending operating hours. For example, in retaining, recruiting, and training staff to conduct the necessary processes to operate systems safely during the extended time window – which could include unsociable hours. This could impact the Bank of England as the operator of RTGS and CHAPS and as a CHAPS direct participant. It will also impact CHAPS direct participants, RTGS account holders, FMIs that settle in RTGS, as well as other institutions that engage in financial activities linked to RTGS.

That being said, it is important to recognise that there are many different models for operating systems during 'open' hours and there could be different staffing needs in different hours. In addition, in the long term a near 24x7 operating model could lead to greater automation and thereby reduce staffing requirements. More work is needed to understand the staffing impact of different models, and to understand how to best mitigate any negative consequences for existing or prospective future operational staff.

As with all costs, this impact will differ between institutions. From the feedback received so far, we anticipate that global participants will face comparatively lower additional operating costs relative to operations than domestic firms, due to their ability to leverage staff in other time zones to handle tasks in the extended time window.

Question

Q4: What do you see as the key cost drivers for extending RTGS and CHAPS operating hours for (a) your organisation and (b) the UK or global financial system? In your response, please consider the different cost drivers for extending the operating hours of RTGS alone and extending both RTGS and CHAPS hours.

4.2: Risks and challenges for extended hours

Extending RTGS operating hours, in particular to near 24x7, would create certain risks and challenges that would need to be managed. Feedback so far has stressed the acute challenge resulting from limited downtime for system maintenance and upgrades. They also noted the need to consider technological, legal, and commercial impacts – for example from needing to change business conventions like 'value date' and 'business day'. Extending hours overnight and to the weekend could also impact operational and liquidity risk.

Limited downtime for system maintenance and upgrades

During engagement with industry so far, several participants have highlighted the need to consider how systems will undertake necessary maintenance and upgrades with limited downtime – particularly when considering near 24x7 operations.

The downtime window allows a respite to fix technical/operational glitches and issues that arise during the day. Several activities – such as adding new functionality, applying software patches, testing the cyber resilience and addressing technical requests (eg to onboard new

CHAPS direct participants) – are typically completed during scheduled downtime. Reduced or virtually non-existent closure times would place an additional burden on payment system participants in dealing with these fundamental issues. Processes may need to be redesigned to ensure they are compatible with extended hours, likely involving additional automation and flexibility.

It is important to note that this is the primary reason for exploring the case for **near** 24x7, rather than full 24x7 operations. The Bank of England will work with industry to understand the appropriate length of downtime required to enable necessary maintenance and testing to take place. We also plan to engage with our international community to understand how they operate near 24x7 while carrying out these required processes.

Changes needed to market conventions and practices

Changes to RTGS and CHAPS operating hours might impact certain market conventions. For example, if RTGS and CHAPS were operating over the weekend, the industry would need to consider what the implications would be for terms such as ‘business day’ and ‘value date’. Similarly, for near 24x7 operations, the industry would need to consider the terms ‘start and end of day’. Agreeing these conventions will take some time and will require collaboration with industry participants.

Operational and liquidity risks

Extending RTGS operating hours will extend the window in which operational or liquidity risks can materialise. Safety and resilience are our highest priorities. Assessing and managing any risks involved will be a big part of the project, and no change to RTGS will be adopted if it will lead to an increase in operational, liquidity or financial stability risk that cannot be mitigated.

Operational issues could involve errors, fraud, money laundering/terrorist financing, or cyber-attacks. All financial institutions should have transaction monitoring processes in place to combat operational risks. If any extension were to be adopted, they would need to ensure these were sufficient for the new model and in place for the extended window.

In addition, the transition to new operating hours could create additional operational risks. For example, from new and unfamiliar systems, new staff, increased handovers throughout the day, and from reduced downtime creating additional burden to deal with issues. Measures to appropriately train, communicate with and take care of staff should be adopted where necessary to protect resilience.

Liquidity risks include a decline in deposits or rise in withdrawals – from either retail or wholesale depositors. Participants will need to ensure sufficient liquidity to support their activities during new operating hours and to understand the potential implications on their

broader liquidity management approaches. This will be impacted by the (un)availability of funding/liquidity. For example, interconnected financial markets (eg securities, FX and interbank money markets) may not be available during extended hours.

4.3: Additional policy implications for the Bank of England

The Bank of England is analysing the potential impact of an extension to RTGS hours on its policy functions – including for monetary policy and financial stability.

The relevance and impact of these issues will depend to a large degree on the actual usage of the extended operating hours. In the early stages after extension, changes to operating hours of money markets and business hours of financial institutions may be limited. However, these issues might gain relevance in the longer term, as the payments industry and financial markets evolve and adapt to the extended hours.

Monetary policy

RTGS is a critical component of the ecosystem through which the Bank implements monetary policy. Short-term market interest rates are held close to Bank Rate through a variety of market operations, including the remuneration of commercial banks' reserves. Transactions in reserves by both commercial banks and the Bank of England are settled in RTGS. Extending RTGS operating hours could lead to changes in the timings of market transactions, for example there could be extended activity in the new hours.

A significant extension of operating hours (to near 24x7) may require changes to the administration, including remuneration, of reserves. The Bank will undertake further work to understand the consequences for money markets and its operations.

Significant changes to the definition, production and publication time of the Sterling Overnight Index Average (SONIA) benchmark, which is based on wholesale overnight unsecured deposits, might also be required.

Financial stability and resolution

In general, extended RTGS operating hours does not itself create additional financial stability risk beyond those already faced by firms and the financial system. But it does extend the window in which risks could materialise. The Bank will keep under review the extent to which changes to RTGS operating hours may have implications for the broader functioning of the financial system, for example on market conventions or securities settlement hours, and any associated risks – and we welcome feedback in relation to this.

In the event of a firm being in – or being perceived to be in – financial stress, the extended hours would increase the time window during which certain withdrawals from the firm could settle; though with payment systems such as Faster Payments, depositors may expect to be

able to access and move their funds near 24x7. While the extended RTGS operating hours would not change the underlying risk of the firm failing, they could potentially accelerate the rate at which liquidity is required by the firm, including to support an orderly resolution. This could therefore increase the speed at which the firm has to source funds, including through potential central bank lending where access to private sector funding is disrupted. The Bank intends to consider further the operational impact (including on its internal processes) of any extension.

If a decision is taken to extend, the Bank will need to consider whether and how to extend the hours in which its operational standing facilities and Discount Window Facility are available to support liquidity needs. Changes to the Bank's reserves forecasting model may also be required.

Generally, in practice, bank resolutions are carried out where possible when securities settlement systems are closed, to allow for an orderly execution of the process to affect the nature and ownership of tradable bank debt and other liabilities (commonly known as 'bail-in').

It follows that, if an extension of RTGS operating hours were, in time, to lead to a subsequent extension of wider securities settlement operating hours, it could potentially affect resolution processes. At this time no such proposals are under consideration. Similarly, we believe that the extension of operating hours would be unlikely itself directly to affect CCP resolution arrangements.[6]

Consistent with the key principle that the responsibility for being resolvable rests with firms, we would expect firms with a stabilisation (bail-in or transfer) preferred resolution strategy to demonstrate they have reflected any extension to RTGS operating hours in their capabilities to support resolvability, for example to provide information on its liquidity position needed by the Bank to execute a resolution.[7]

Question

Q5: What do you see as the key potential risks, challenges and policy implications from extending RTGS and CHAPS operating hours for (a) your organisation and (b) the UK or global financial system? In your response, please consider the differences between extending the operating hours of RTGS alone and extending RTGS and CHAPS hours in tandem.

5: Implementation considerations

5.1: Implementation path to near 24x7

We recognise that operating 24x7 or near 24x7 would be a significant change. The feedback received so far indicates that industry may prefer a staggered approach to extending RTGS and CHAPS operating hours, with clear milestones to support budgeting and planning.

Our initial vision based on the analysis so far is that a potential first step could be to open CHAPS earlier in the morning for settlement (eg from 06:00 to 01:00) and to extend the window for contingency extensions to later in the evening (eg from 20:00 to 23:00). This would help to enhance cross-border payments by increasing overlap with the EU (T2 now allows payments to be made from 01:30 GMT), and APAC countries.

To reach an operating period of near 24x7, we'd need to understand how best to structure the new operating day. For example, the new operating day could commence at midnight, or the system could continue to close at 18:00 (as it does currently), and then reopen to start the following day after a short downtime window. More work will be required to understand the various impacts and the appropriate structure in due course.

The length of implementation would depend on the proposed length of extension for each stage. Consensus from industry is that they would benefit from a long lead time – of at least 18 to 24 months – for any extension length, including a few hours. Members highlighted the need to go through extensive budgeting and planning processes for such a large project – including to negotiate contracts and recruit and train staff where necessary – which take time. They also noted the existence of concurrent developmental work which draws on similar resources – such as other features under consideration in the Roadmap for RTGS beyond 2024 or changes to the retail payment systems.

Questions

Q6: If we were to move to near 24x7, would it be better for your organisation if the change is implemented all at once or in a phased approach? In your response, please consider your implementation/transition strategy, anticipated costs, etc.

Q7: Approximately how long would it take for your organisation to make the necessary changes to support a potential first stage extension – for example extending to start operations at 01:00 rather than 06:00 currently? What actions

would you need to undertake in this time?

Q8: Approximately how long would it take for your organisation to make the necessary changes to support near 24x7 RTGS and CHAPS operation? What actions would you need to undertake in this time?

Q9: Do you have any views at this stage on how to structure a longer operating day, nearing 24x7? For example, when to open and close the system, and how long for?

5.2: Optionality of new operating hours

There are substantial variations in the benefits and costs of an extension between participants. For example, feedback so far suggests that there is relatively less demand for extended RTGS operating hours from participants with a predominantly domestic focus and limited cross-border activity. Recognising that differing business models may result in some firms finding a limited business case for operating near 24x7 at this time, we would like to explore the potential for optionality in connecting to RTGS.

First, we would like to consider a model where participants are able to choose – within reason – the time at which they start their operations (ie initiate start of day processes to open systems and start to submit payments to RTGS).

We recognise that this would allow participants to use extended hours in line with their own business models. Albeit we are also mindful that this optionality could create co-ordination challenges due to the network nature of CHAPS. The effectiveness of extending CHAPS settlement hours relies on maintaining a sufficiently active participant base to generate substantial payment traffic and facilitate liquidity recycling.

Questions

Q10: How much flexibility do you consider should be provided to participants to choose when they start to send payments? Please explain the benefits and costs you see to providing this flexibility for your organisation.

Q11: If the new RTGS model were to operate near 24x7 and embed this flexibility, at what time would your organisation start operating and sending payments? What proportion of payments would you anticipate sending within the new hours? What would be the main factors influencing your decision?

Second, we would like to consider a model where participants are able to choose the time at which they close their systems and stop operations. We consider that providing optionality to engage with later RTGS operations is more challenging than with an earlier extension. This is because all participants are typically required to engage with end of day processes (for example reconciliation) as well as pass on funds received to customers with the same value date.

Questions

Q12: How much flexibility do you consider should be provided to participants to choose when they close their system? Please explain the benefits and costs you see to providing this flexibility for your organisation, and how it could work in practice. Please include in your response any additional implications you envisage for this flexibility that we have not considered above – for example legal implications or end-user expectation.

Q13: If the new RTGS model were to operate near 24x7 and embed this flexibility, at what time would your organisation stop sending payments and close down your systems? What proportion of payments would you anticipate sending within the new hours? What would be the main factors influencing your decision?

5.3: Services provided in new operating hours

Generally, RTGS systems that already operate much longer operating hours (near 24x7) only provide minimal business support during overnight hours (see Box A). Due to the resulting cost factors, our provisional expectation is that the Bank would likely operate a similar model for near 24x7 operations.

Questions

Q14: What services would you expect to be available in the extended hours? Why would these services be required in order for your organisation to operate effectively outside of normal ‘business hours’? For example, would you expect intraday liquidity to be available?

Q15: Would you have any concerns if business support hours from the Bank of England, as the operator of RTGS/CHAPS, remained unchanged (06:00–18:00) even if we were to extend operating hours beyond that? Note that our expectation

is that technical support would remain available throughout the new operating window.

6: Conclusion and next steps

Extending the operating hours of RTGS would have a number of benefits – including for innovation and competition, the speed of cross-border payments and financial stability. But it would also require upfront investment and potential changes to staffing models. Analysing these impacts to find a solution that balances the benefits and costs appropriately for the entire ecosystem – taking into account industry demand and public policy objectives – will be tricky. We will need a range of views to be able to understand the impact on different sectors.

Question

Q16: On balance, considering the analysis so far, what do you consider to be the most appropriate future operating hours for the long term (ie roughly the next 10 years) that balances the benefits, costs and other implications? Do you have any suggestions on an appropriate transition path to achieve this end-state?

The Bank's work to review operating hours is ongoing. This discussion paper aims to be the basis for further research and dialogue between the Bank, the payments industry, technology providers, payments users, financial institutions, academics, other central banks, and public authorities. We encourage anyone with an interest in these issues to respond. We would be grateful if you could provide your responses by 30 April 2024.

Feedback received through this discussion paper will input to the Bank's analysis and decision on future RTGS and CHAPS operating hours. In addition, we will engage in discussions through other outreach programmes with stakeholders – including RTGS participants, trade associations and the international community – to gain further insight into the impacts of and demand for an extension.

The Bank aims to issue a consultation paper in 2025 to formally consult on a proposal for RTGS operating hours. This will include the Bank's initial proposal on the end-state for future RTGS and CHAPS operating hours and if needed a potential implementation path. After assessing consultation feedback, the Bank will communicate a decision on future RTGS operating hours.

If an extension is agreed, the implementation path will depend on the proposed length of extension – which could include multiple stages. Our preliminary thinking is that a possible first stage extension could be implemented towards the second half of the decade.

These timelines are indicative only, to provide readers with an idea of the Bank’s current plans. They are not conclusive, and any implementation timelines will depend on the length of extension proposed and will be discussed with industry. At a minimum, the Bank would give at least one year’s notice of any future changes to RTGS and CHAPS operating hours.

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1. CHAPS operated by the Bank of England is the UK’s high-value payment system.
 2. The UK’s securities settlement system (CREST) is operated by Euroclear UK & International (EUI). CREST settles UK securities such as gilts, equities and money market instruments in sterling, euro and US dollars.
 3. CLS, operated by CLS Bank, is a foreign exchange settlement system that eliminates settlement risk in participating currencies.
 4. Bacs, Image Clearing System (ICS) for cheques, Faster Payments, LINK, Mastercard Europe, PEXA and Visa Europe.
 5. The sight deposit account is used for cash withdrawals and direct transactions with the SNB which are routed through the SNB’s accounting system.
 6. Purple Book, [The Bank of England’s approach to resolution](#).
 7. [Resolvability Assessment Framework](#).