



Project Acacia –

Exploring the role of digital money in wholesale tokenised asset markets

Consultation Paper

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November 2024

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1. Introduction

1.1 Preamble

This consultation paper has been prepared by the Reserve Bank of Australia (RBA) and the Digital Finance Cooperative Research Centre (DFCRC). It describes a joint research project – ‘Project Acacia’ – to explore how different forms of digital money and associated infrastructure could support the development of wholesale tokenised asset markets in Australia. The paper seeks industry feedback on, and expressions of interest to participate in, the next phase of the project, which will involve exploration and experimentation on approaches to tokenised asset settlement. Project Acacia is overseen by a Steering Committee consisting of senior representatives of the RBA, DFCRC, the Australian Securities and Investments Commission (ASIC), the Australian Prudential Regulation Authority (APRA) and Treasury. An Industry Advisory Group will be established to provide broad-based industry input to the project. This paper seeks expressions of interest from individuals wishing to participate in this group, and describes relevant aspects of Project Acacia as currently proposed by the Steering Committee. However, please note that details of the project may be subject to further consideration and change over the course of the project.

Industry stakeholders are invited to:

- **Respond to the consultation questions in this paper** – by completing **Part 1** of the Response Template in Appendix A.
- **Register their interest in participating in the experimental research phase of Project Acacia in 2025** – by completing **Part 2** of the Response Template in Appendix A.
- **Register their interest in joining the Industry Advisory Group for Project Acacia** – by completing **Part 3** of the Response Template in Appendix A.

Submissions are due by **Wednesday, 11 December 2024**.

The RBA and DFCRC welcome engagement with industry stakeholders on this paper during the consultation period. All enquiries and submissions should be directed to ProjectAcacia@rba.gov.au.

1.2 Reserve Bank of Australia

The RBA is Australia’s central bank. Its legislated duty is to promote the welfare of the Australian people, including by maintaining price stability and full employment. It does this by conducting monetary policy to meet an agreed inflation target, maintaining a stable financial system, acting as banker to the Australian Government, operating the core of the payments system and regulating the wider payments system, and issuing the nation’s currency. Over recent years, the RBA has been exploring whether there is a role for a central bank digital currency (CBDC) in Australia in the context of the RBA’s responsibilities for issuing the currency and supporting the safety and efficiency of the payments system. In support of its research program into CBDC and the future of money in Australia, the RBA is an industry partner of the DFCRC.

1.3 Digital Finance Cooperative Research Centre

The DFCRC is a 10-year, \$180 million research program funded by industry partners, universities and the Australian Government, through the Cooperative Research Centres Program. The DFCRC's mission is to bring together stakeholders in the finance industry, academia and regulatory sectors to develop and harness the opportunities arising from the next transformation of financial markets – the digitisation of assets that can be traded and exchanged directly and in real-time on digital platforms.

1.4 Context

Shaping the future of money in Australia, as the payments and technology landscape evolves, is a strategic priority of the RBA and its Payments System Board.¹ A key initiative related to this strategic priority is to support innovation in wholesale markets by exploring how new forms of digital money and supporting infrastructure could improve the efficiency and resilience of wholesale payments and settlements, support the development of tokenised asset markets and enhance cross-border payments. In recent years, the RBA has led or been involved in a number of domestic and multi-jurisdictional research projects that have explored the potential role, benefits, risks and other implications of CBDC. Most recently, the RBA and DFCRC collaborated on a CBDC pilot project in 2022–2023 that explored potential use cases for a CBDC in collaboration with industry participants (Box A). This project highlighted strong interest from industry participants in asset tokenisation and the potential for a CBDC to be used for the 'atomic' settlement of transactions involving tokenised assets.²

As observed internationally,³ industry stakeholders in Australia are exploring the potential for asset tokenisation for a variety of reasons, including its potential to increase efficiency and reduce risk in the issuance, trading, clearing, settlement and servicing of assets. Tokenisation of established asset classes faces a number of challenges, though potential benefits could also be large. For instance, based on the benefits observed following earlier periods of technological innovation in financial markets (and a range of other assumptions), potential transaction cost savings from tokenisation of Australian financial markets could be in the range of \$1–4 billion per year, with potential savings of up to \$13 billion per year available to issuers in Australian capital markets.⁴ These estimates do not include the potential benefits associated with the development of new markets that tokenisation may facilitate.

The starting point for Project Acacia is that tokenisation could be a positive innovation in Australian financial markets if the opportunities and risks are understood and the risks effectively managed. There is, however, no shortage of challenges in developing tokenised asset markets, and there is a need to better understand if some of the claims about the benefits of tokenisation stand up to closer scrutiny.⁵ Clarifying the regulatory framework for asset tokenisation will be an important element in this, to promote regulatory certainty for industry stakeholders and to ensure that regulators have appropriate powers and tools to

¹ As outlined in RBA (2024), '[Corporate Plan 2024/25](#)'.

² Tokenisation in this context refers to the digital representation of real-world assets as tokens that can be stored, traded and transferred on programmable platforms, such as those based on distributed ledger technology. These asset tokens can act like digital bearer instruments that contain rich information and can be programmed via smart contracts to automatically perform various functions, such as pre- and/or post-trade functions, that would be difficult to achieve in traditional financial markets.

³ Bank for International Settlements (BIS) and Committee on Payments and Market Infrastructures (CPMI) (2024), '[Tokenisation in the context of money and other assets: concepts and implications for central banks](#)', Report to the G20, 21 October.

⁴ Jones B (2023), '[A Tokenised Future for the Australian Financial System?](#)', Speech at The Australian Financial Review Cryptocurrency Summit, Sydney, 16 October.

⁵ Jones B (2024), '[Financial Innovation and the Future of CBDC in Australia](#)', Speech at the Intersekt Conference, Melbourne, 18 September.

safeguard market integrity and financial stability, taking into account the changes to existing market models and risk profiles that may result from tokenisation.

Another important consideration in the development of tokenised asset markets will be the forms of money – public and/or private – that are used for settlement, especially if those markets have the potential to become systemically important. The interbank settlement of financial market transactions today in digital central bank money – via Exchange Settlement Accounts (ESAs) at the RBA – is one of the foundations of financial system stability. As the safest and most liquid settlement asset, central bank money is free of the credit and liquidity risks that feature in private money. Central bank money also plays an important role as an anchor for the two-tier monetary system, comprising the central bank and commercial banks. The ability to convert the money that commercial banks issue (i.e. deposits) at par into central bank money strengthens confidence in private money as a means of payment and store of value, and supports the ‘singleness of money’. The important role that central bank money plays in supporting financial and monetary stability is recognised in the international standards for financial market infrastructures (FMIs).⁶

The development of tokenised asset markets raises questions about whether and how the role of central bank money might need to evolve and the associated policy implications. If the way in which central bank money is provided today does not evolve, settlement activity could be concentrated in private forms of digital money, such as tokenised deposits or stablecoins. If these markets became systemically important, this could have adverse financial stability implications, as implied by the Principles for Financial Market Infrastructures.

There are a number of ways in which central bank money could potentially evolve to support settlement in tokenised asset markets; some of these ways relate to changes in *how* it is accessed and to *whom* it is made available. While some changes could support efficiency and innovation in financial markets, they also raise a range of material policy and operational issues that would need to be carefully considered and addressed. Changes in the provision of central bank money could, for example, have significant implications for the central bank’s balance sheet and the risks to which it is exposed. It could also present challenges to the resilience of its settlement infrastructure and the implementation of monetary policy, and there could be reputational concerns associated with making a digital form of central bank money available to a wider range of entities than at present. It is important to recognise that broadening access to central bank money for settlement in tokenised markets would also entail obligations and responsibilities for system participants.

Any evolution of central bank money to meet the requirements of tokenisation would involve costs and benefits for a range of stakeholders, including the central bank, market participants and infrastructures. It could also affect the achievement of public interest objectives, such as financial and monetary stability. Understanding these implications remains an important research objective.

In Project Acacia, the RBA in collaboration with the DFCRC, is seeking to advance its understanding of these issues. There are a range of questions that the project will seek to address, including:

- In what form or forms might central bank money need to be made available, and to whom, to support tokenisation?

⁶ These standards, known as the Principles for Financial Market Infrastructures (PFMI), provide guidance on how to maintain the safety and efficiency of FMIs. Principle 9, which relates to money settlement, states that an FMI “should conduct its money settlements in central bank money where practical and available”. See: [Principles for financial market infrastructures](#).

- What technical and functional capabilities would central bank money need to possess to realise the benefits in a token economy, and what would the wider policy and operational implications of such capabilities be?
- What existing and new forms of privately issued money could be used in a token economy and how might these interoperate?
- What are the respective roles that central bank money and privately issued money should play in tokenised asset markets, to promote a stable and well-functioning financial system?

The project's focus on wholesale markets and settlements reflects the RBA's strategic commitment to prioritise its research agenda on wholesale digital money and infrastructure, including wholesale CBDC.⁷ Industry engagement and collaboration will be an essential part of Project Acacia, given the complementary and mutually supporting roles of public and private money in the economy, and the different perspectives of key stakeholders in wholesale market development and capital formation, including issuers, institutional investors, platform operators, liquidity providers and others.

The government agencies represented on the Steering Committee for Project Acacia – ASIC, APRA, RBA and Treasury – have a shared interest in supporting responsible innovation in wholesale financial markets. The agencies view tokenisation of real-world assets as having transformative potential that may promote more competitive, efficient, transparent and resilient financial markets. At the same time, they recognise that more research is needed. All four agencies have an interest in better understanding the technologies and business models that could underpin tokenised markets, and to identify unwarranted barriers to tokenisation in Australia, including in the existing regulatory framework. The research findings of Project Acacia will contribute to the development of policy and (where appropriate) building the case for regulatory adjustment by each of the agencies within their respective areas of policy or regulatory responsibility. It is envisaged that learnings from the project may inform not only the future regulation of tokenised asset markets, but also the future of regulatory 'sandbox' arrangements for trialling new forms of financial market infrastructure (e.g. through the statutorily required independent review of ASIC's Enhanced Regulatory Sandbox). The agencies recognise that research projects of this nature require an investment of time and money by industry stakeholders that wish to participate, and they intend to take – so far as they are able – a facilitative approach to consideration of any regulatory relief that may be needed.

⁷ RBA and Treasury (2024), '[Central Bank Digital Currency and the Future of Digital Money in Australia](#)', September.

Box A: CBDC Pilot Project

During 2022 and 2023 the RBA and DFCRC collaborated on a research project that explored use cases and business models that could be supported by the issuance of a CBDC in Australia. The project involved the RBA issuing a limited-scale 'pilot' CBDC in a ring-fenced environment to selected industry participants. These participants sought to demonstrate how a CBDC could be used to provide innovative and value-adding payment and settlement services to households and businesses. The pilot CBDC was issued as a real legal claim on the RBA.⁸

There was significant interest from industry participants in the project in exploring the tokenisation of financial and other (real) assets on distributed ledger technology (DLT) platforms, with CBDC being used in the 'atomic' settlement of transactions. Around one-third of the piloted use cases explored opportunities for a CBDC to enhance the operation of various types of asset markets. This included traditional debt securities markets, where settlement times are typically measured in days. Several different types of less liquid assets were also tokenised in the transactional pilot, including Australian carbon credit units, NSW biodiversity credits and supplier invoices, with settlement effected in the pilot CBDC. Participants noted that the tokenisation of assets on DLT platforms had the potential to deliver a number of benefits, including improving the efficiency, transparency, liquidity and accessibility of asset markets.

A key finding of the CBDC pilot project was that the availability of tokenised money and assets on the same programmable platform could facilitate reductions in cost and risk in conventional models of trading, clearing, settlement and asset servicing. This could occur in at least two ways:

1. *By enabling a closer integration of trading and settlement:* The 'atomic' exchange of tokenised money and assets on the same ledger could (in theory) occur instantaneously upon trade execution, driving down counterparty exposure and collateral costs.
2. *By enabling programmable payments:* The ability to pre-program financial market transactions that involve payments (such as coupon payments on bonds), using tokenised money and assets, has the potential to reduce costs and risks associated with manual processes.

Additionally, the CBDC pilot project highlighted that there are opportunities for a wholesale CBDC to act as a complement to, rather than a substitute for, new forms of privately issued digital money, such as tokenised bank deposits and stablecoins. For example, use cases highlighted the potential role that a CBDC could play in promoting interoperability and uniformity of new forms of private digital money. The project also highlighted challenges in integrating a standalone CBDC platform with industry use case platforms, which in turn indicated scope for further research on CBDC deployment models to assess the implications and technical requirements to balance risks with the opportunities for industry innovation.

⁸ See RBA and DFCRC (2023), '[Australian CBDC Pilot for Digital Finance Innovation](#)', Project Report, August.

2. Project Overview

2.1 Purpose

The purpose of Project Acacia is to explore the role that central bank and privately issued forms of digital money could play in supporting the development of wholesale tokenised asset markets, with a particular focus on transaction settlement and related processes. A key research question is whether there might be a need for a new form of tokenised central bank money in the form of a wholesale CBDC to maximise the benefits from asset tokenisation, or whether there are enhancements to the RBA's existing infrastructure that could support tokenised settlement using ESA balances, perhaps complemented by privately issued tokenised money such as bank deposit tokens. A related question is whether, to facilitate tokenisation, access to wholesale central bank money in either of those forms would need to be expanded beyond institutions currently eligible to hold an ESA, and if so, what policy and operational questions that expansion might pose.

2.2 Project structure

Project Acacia is proceeding over two phases.

2.2.1 Phase 1

In Phase 1, completed in August 2024, the RBA and DFCRC set out to define a 'design space' comprising a range of potential settlement models for using different forms of digital money to settle transactions in tokenised assets. From this design space, five distinct settlement models were explored in greater detail. Criteria for evaluating the implications of these different settlement models, and the trade-offs involved in each one, were identified. This work is summarised in Section 3, which also includes questions for industry stakeholders on some related aspects. This phase of the project was complemented by targeted engagement with a number of industry stakeholders.

2.2.2 Phase 2

In Phase 2, to take place in 2025, the RBA and DFCRC, in collaboration with industry stakeholders, will develop and test prototypes of one or more models for settlement in wholesale tokenised asset markets, framed by use cases brought forward by industry. Depending on the settlement model(s) selected for exploration, this may involve the utilisation of the RBA's existing settlement infrastructure (the real-time gross settlement (RTGS) system and ESAs), and/or the issuance by the RBA of a pilot wholesale CBDC and by private sector parties of deposit tokens or other forms of tokenised money.

Subject to appropriate vetting and controls, the RBA is open to testing issuance of pilot CBDC directly onto one or more third-party tokenised asset platforms operated by use case proponents (in contrast to the 2022–23 CBDC Pilot Project, where a standalone pilot CBDC platform controlled by the RBA was utilised). This would provide an opportunity to explore the benefits and challenges associated with this kind of deployment model. However, it should not be assumed from this that the RBA is predisposed to this kind of deployment model, which would represent a significant departure from the current centralised model for central bank settlement infrastructure.

The RBA and DFCRC do not intend to set-up or make available a simulated or pilot tokenised asset platform or trading venue for Phase 2. Industry participants will need to establish these platforms to suit their needs.

The intent of Phase 2 will be to explore issues of technology design, risk management, governance and regulation associated with different settlement models for wholesale tokenised asset markets. Specific areas of research interest to the RBA and DFCRC are set out in Section 3. The project will also be an opportunity to explore some of the technical, policy, legal and regulatory considerations associated with different forms of tokenised money.

The RBA and DFCRC seek to understand the wholesale market use cases industry stakeholders would be interested to explore, through development and testing in collaboration with the RBA and DFCRC, as part of Phase 2 of this project. Industry stakeholders are invited to respond to this paper with input on their areas of interest. The RBA and DFCRC will use this input to invite industry stakeholders to submit more detailed use case proposals, as outlined in Section 4 of this paper. They will then select proposals for development and testing. It is anticipated that there should be flexibility within the project to test selected use cases as either a pilot (involving real assets and money) or proof of concept (involving simulated assets and money), depending on the needs of the use case and as agreed with the RBA and DFCRC.

All use case proposals submitted, whether or not they are tested in the project, will contribute to the broader research findings of the project.

The RBA and DFCRC will publish a report on the findings of the project at the conclusion.

2.3 Industry Advisory Group

The RBA and DFCRC intend to establish an ‘Industry Advisory Group’ of selected industry experts, to support Phase 2 of Project Acacia by providing input on the project pathway, findings and future research opportunities. Expressions of interest in joining the Industry Advisory Group are sought in Section 5 of this paper.

2.4 Indicative project timelines

Indicative milestones for Phase 2 of Project Acacia are set out in Table 1.

Table 1: Project Acacia Phase 2 Indicative Timeline

Milestone	Timeframe
Publish Consultation Paper to describe project and invite industry feedback and use case submissions	Nov 2024
RBA and DFCRC engage with industry stakeholders on use cases	Nov – Dec 2024
Consultation Paper submissions close	11 Dec 2024
RBA and DFCRC select interested parties to submit more detailed use case proposals	Mid-Dec 2024
Selected parties submit more detailed use case proposals	Mid-Feb 2025
RBA and DFCRC engage with selected parties on their detailed use case proposals, including consideration of regulatory implications	Feb – Mar 2025
Membership of Industry Advisory Group announced	Mar 2025
RBA and DFCRC select and announce use case proposals for development and testing upon finalisation of regulatory approvals or relief (where applicable) from relevant regulators	From Apr 2025
Development and testing of selected use case proposals	May – Oct 2025
Publish report on project findings	End of 2025

2.5 Project scope and exclusions

Project Acacia has a domestic wholesale focus in terms of use cases. Industry stakeholders are invited to propose use cases that demonstrate the ways in which existing or new forms of digital money – public and private – can support innovation in wholesale domestic markets. Industry stakeholders who have an interest in exploring use cases that may not be within the scope of Project Acacia are still encouraged to express their interest, as there may be opportunities to explore those in a later phase or with the DFCRC outside of Project Acacia.

While the analysis in Phase 1 of Project Acacia has been framed by use cases involving secondary market delivery-versus-payment (DvP) settlement in tokenised markets, the RBA and DFCRC welcome submissions of other use cases relevant to wholesale markets (e.g. primary market issuance and corporate actions involving payments or settlements). The RBA and DFCRC are also interested to explore through Phase 2 the broader question of how existing and/or new payments infrastructure can facilitate tokenised asset markets – for example, through the programmability of money and/or assets and by enabling atomic settlement, which in turn can support the sequencing of settlement and related processes for execution on an asset platform (so-called ‘composability’). Further information on project scope and exclusions can be found in Section 4.

While the results of Project Acacia will help inform future decisions on wholesale CBDC and/or RTGS/ESA arrangements, the RBA’s involvement in this project does not imply any commitment to issue a CBDC at the end of the project, or at any future time, or to make any other changes to existing central bank money arrangements.

2.6 Who should respond to this paper?

The RBA and DFCRC would like to hear from:

- industry stakeholders with views on the consultation questions in this paper (refer Section 3)
- entities that are keen to contribute to the research planned for Phase 2, as described in this paper (refer Section 4)
- individuals who are willing to contribute their expertise by joining the Industry Advisory Group for Project Acacia (refer Section 5).

The deadline for submissions is **Wednesday, 11 December 2024**.

The RBA and DFCRC welcome engagement with industry stakeholders on this paper during the consultation period. All enquiries and submissions should be directed to **ProjectAcacia@rba.gov.au**.

All submissions will be treated as confidential. Submissions will not be published; however, the RBA and DFCRC may publish a summary of submissions received without attribution to individual persons or entities. These submissions and information from subsequent engagements with industry stakeholders will be utilised for research purposes by the RBA and DFCRC and may be shared with other Australian regulatory agencies.

3. Phase 1 – Conceptual Research and Questions for Consultation

Phase 1 of Project Acacia, which was undertaken by the RBA and DFCRC during the first half of 2024, was an initial desktop research phase in which different models for the settlement of tokenised asset transactions were identified and evaluated. The focus was on exploring how different settlement models – utilising various forms of digital money and associated infrastructure – could facilitate the DvP settlement of tokenised asset transactions (i.e. a transaction between a buyer and seller whereby the transfer of a tokenised asset occurs if and only if the associated payment has been made). Considerations and requirements that could be relevant to evaluating and comparing different settlement models were identified.

This section presents the key results of that conceptual research and seeks stakeholder feedback on some questions arising from this work (see below). Five settlement models were subject to a structured evaluation against the identified considerations, the results of which are summarised in Appendix B.

3.1 The role that different forms of money could play in tokenised asset markets

Different forms of digital money – both public and private, and tokenised and non-tokenised – could be deployed in different ways to support settlement and other functions in tokenised asset markets. A range of potential deployment options (referred to as ‘settlement models’ in the context of the DvP settlement use case considered in the first phase) are outlined in a design space diagram (Figure 1). These settlement models can be differentiated in the following main ways:

- **Whether money and assets are on the same or different platforms:** This has implications for the nature of the DvP settlement process and associated risks and complexity. For example, if the money and assets to be exchanged as part of the settlement exist on different platforms, this will require some form of orchestration mechanism between the two platforms to ensure DvP settlement. If the money and assets exist on the same platform (e.g. the tokenised asset platform), then this opens up the possibility for the money and assets to be exchanged ‘atomically’ as part of the settlement process (see Figure 2).⁹
- **Type of settlement asset:** The form of digital money tendered by or on behalf of the buyer of a tokenised asset at settlement may be a liability of the central bank (e.g. ESA balances or a wholesale CBDC) or private sector entities (e.g. reserves-backed digital currency (RBDC), deposit tokens or stablecoins) (see Box B for a description of these different kinds of settlement assets). These settlement assets may have different characteristics in terms of liquidity and credit risk, and who can hold them. For example, there may be restrictions on who can directly hold a wholesale CBDC (as there are currently restrictions on who can hold an ESA at the RBA). Settlement assets issued by the private sector – such as bank-issued deposit tokens – may only be able to be held by individuals and

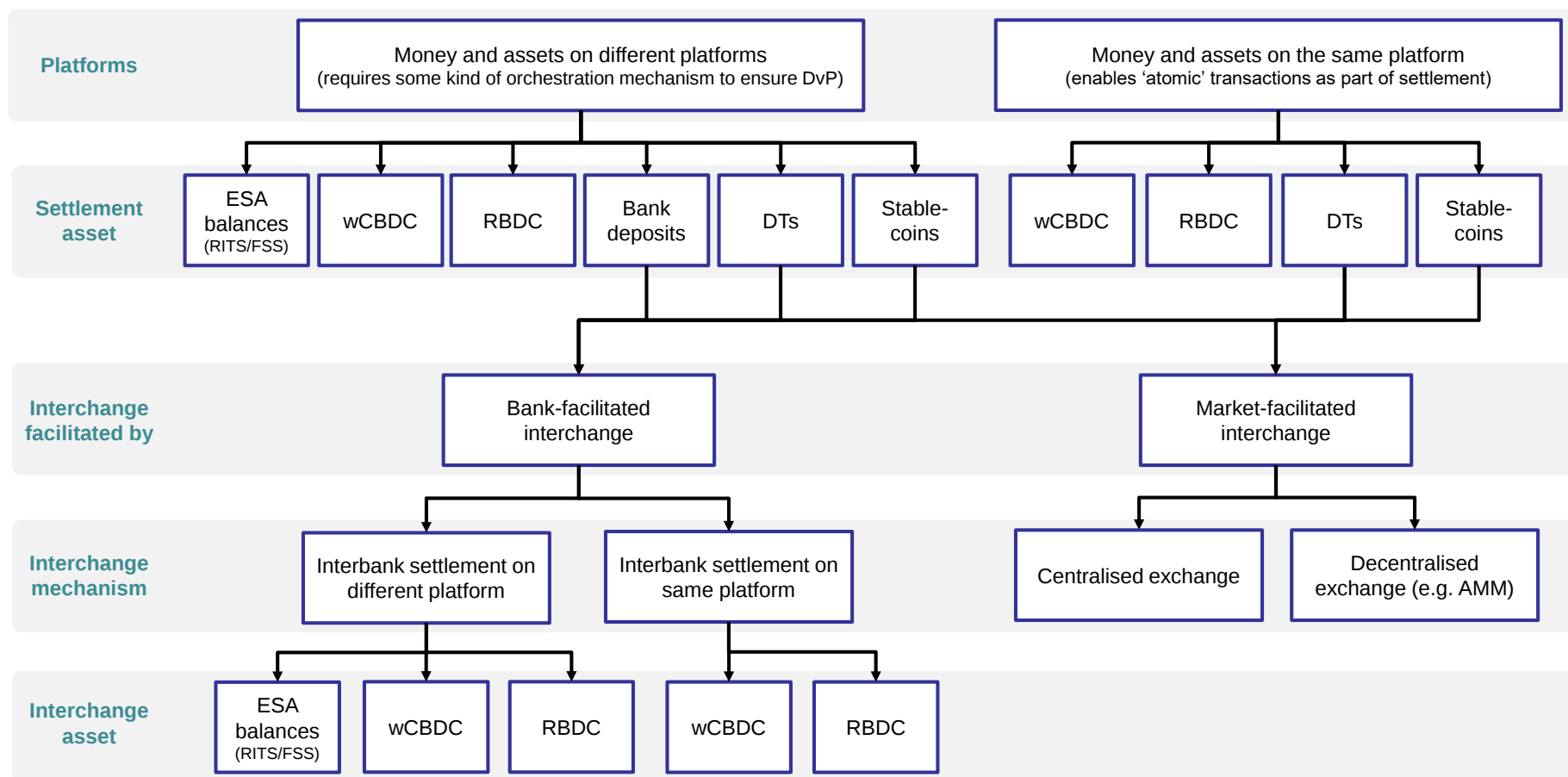
⁹ Here we refer to ‘atomic settlement’ as a process where settlement occurs in an integrated fashion, such that it is technologically infeasible for one leg of a transaction to occur without the other.

entities that have been subject to the issuer's know-your-customer (KYC) checks. Restrictions on who can directly hold different forms of privately issued money create a need for intermediaries to facilitate settlement on behalf of their customers, resulting in a process we refer to in this paper as 'interchange'.

- **'Interchange' mechanisms for privately issued digital money:** As noted above, some forms of digital money (e.g. bank-issued deposit tokens) may not be freely transferable in the manner of a 'bearer instrument'. Where a buyer tenders that kind of money as part of the settlement, it must be converted to a form of money that can be accepted by the seller. This gives rise to the need for an 'interchange' mechanism to convert one form of money to another. Depending on the nature of the money that is used in the settlement, this may occur in one of two ways:
 - *Bank-facilitated interchange:* where the buyer wishes to pay using a settlement asset that is a claim on their bank (e.g. a deposit token) and the seller wishes to receive a form of money that is a claim on their bank as part of the settlement, then the interchange could be facilitated by the two banks. The buyer's bank would debit the buyer's deposit account (or reduce the buyer's holding of deposit tokens) and pay a corresponding amount to the seller's bank, which in turn would credit the seller's account (or increase the seller's holding of deposit tokens) (see Figure 3). The use of central bank money for the interchange payment between the two issuing banks could support the at par convertibility of their respective deposit tokens.
 - *Market-facilitated interchange:* The buyer's nominated settlement asset is exchanged for a form of money that can be accepted by the seller by a third party (essentially acting as a market maker) that stands within the KYC perimeter of both forms of money and holds liquidity in both. For example, consider a buyer that wishes to settle a tokenised asset purchase using a non-bank issued stablecoin, but the seller wants to be paid in deposit tokens issued by its bank. In this scenario, the buyer could exchange the stablecoin for the deposit tokens at an exchange (marketplace) operated by a third party and then pay the deposit tokens to the seller. The conversion of one form of money to another via this process may or may not occur at par, depending on factors such as the relative demand and supply of the different forms of money.

While the design space of settlement models in Figure 1 is illustrated with reference to a single wholesale tokenised asset platform, it is assumed that in a token economy there will be multiple tokenised asset platforms, and these platforms may or may not use DLT.

Figure 1: Design Space for Deployment of Digital Money in Tokenised Asset Markets *



* See Box B for descriptions of settlement assets

Box B: DvP settlement assets

Phase 1 of Project Acacia considered the use of the following forms of digital money as settlement assets:

ESA balances: A form of digital money issued by the RBA and represented by the balance of funds in a financial institution's Exchange Settlement Account (ESA) held at the RBA. This form of central bank money is only available to financial institutions that are eligible to hold an ESA and is used to meet settlement obligations to other ESA holders.

Wholesale CBDC (wCBDC): A central bank digital currency that may only be held by a limited range of entities for use in wholesale payment and settlement systems. The limitations on access to a wholesale CBDC might be similar to the restrictions on who can hold an ESA, or they may be less restrictive – this would be a question of policy to be determined if a wholesale CBDC were to be issued. A key difference between ESA balances and wholesale CBDC is that the latter could use an entirely different form of technology that offers new functional capabilities and/or permits new types of transactions.

Deposit token (DT): A tokenised form of commercial bank money backed by the balance sheet of a prudentially regulated bank. It is assumed that a deposit token is not freely transferrable as it could be held only by customers of the issuing bank (who have been subject to the issuing bank's KYC checks). Consequently, the use of deposit tokens as a settlement asset necessitates some form of 'interchange' mechanism, whereby the deposit tokens issued by the buyer's bank can be converted to deposit tokens issued by the seller's bank that the seller can accept as payment for the transaction. The term 'tokenised deposit' is sometimes used interchangeably with 'deposit token', and at other times to distinguish a digitally native token representing a deposit liability of the issuer (deposit token) from a digital representation of a traditional account-based deposit product (tokenised deposit).

Reserves-backed digital currency (RBDC): A tokenised form of money issued by a private sector entity (possibly a special-purpose vehicle set up by an industry consortium), which is fully backed by funds held by the issuing entity in a pooled ('omnibus') account at the central bank. It is expected that the reserves would be held under a structure designed to protect the entitlements of token holders in the event of the issuer's insolvency. This form of money is sometimes referred to as a 'synthetic CBDC'. However, an RBDC is not a liability of the central bank at which the reserves are held and accordingly is not 'central bank money'.¹⁰

Fiat-backed stablecoin: A tokenised form of privately issued money that is intended to maintain a stable value relative to a particular fiat currency. It is assumed to be issued by an entity that is licensed to issue a stablecoin. (The Australian Government has proposed a regulatory framework for 'payment' stablecoins as part of its planned payments licensing reforms.¹¹) These stablecoins are backed by assets that are denominated in the relevant fiat currency and meet any applicable regulatory requirements related to the quality and liquidity of asset backing.

¹⁰ See World Economic Forum (2024), '[Modernizing Financial Markets with Wholesale Central Bank Digital Currency \(wCBDC\)](#)', Report, April.

¹¹ See Treasury (2023), '[Payments System Modernisation \(Regulation of Payment Service Providers\)](#)', Consultation Paper, December.

Figure 2: Illustration of DvP Settlement Process Where Money and Assets are on the Same or Different Platforms

In the diagram on the left, money and assets exist on the same platform (the tokenised asset platform), and these may be exchanged ‘atomically’ as part of the settlement process. In the diagram on the right, the money and assets to be exchanged as part of the settlement exist on different platforms, necessitating some form of orchestration mechanism between the two platforms to ensure DvP settlement (represented in this diagram by the ‘synchronisation coordinator’).

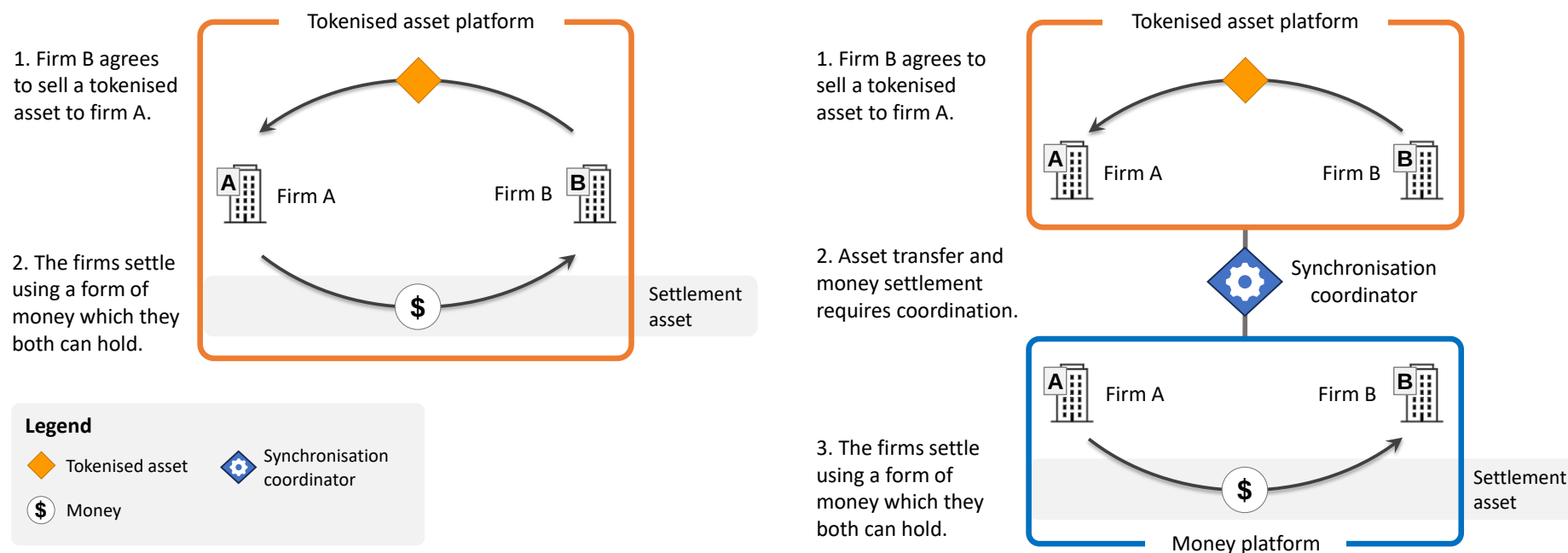
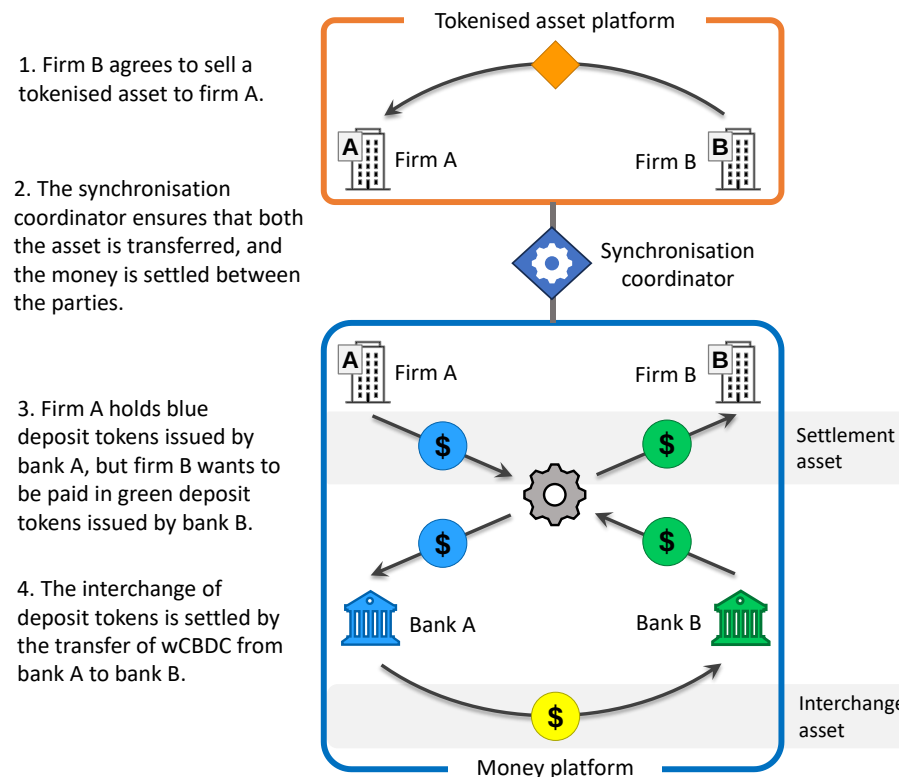
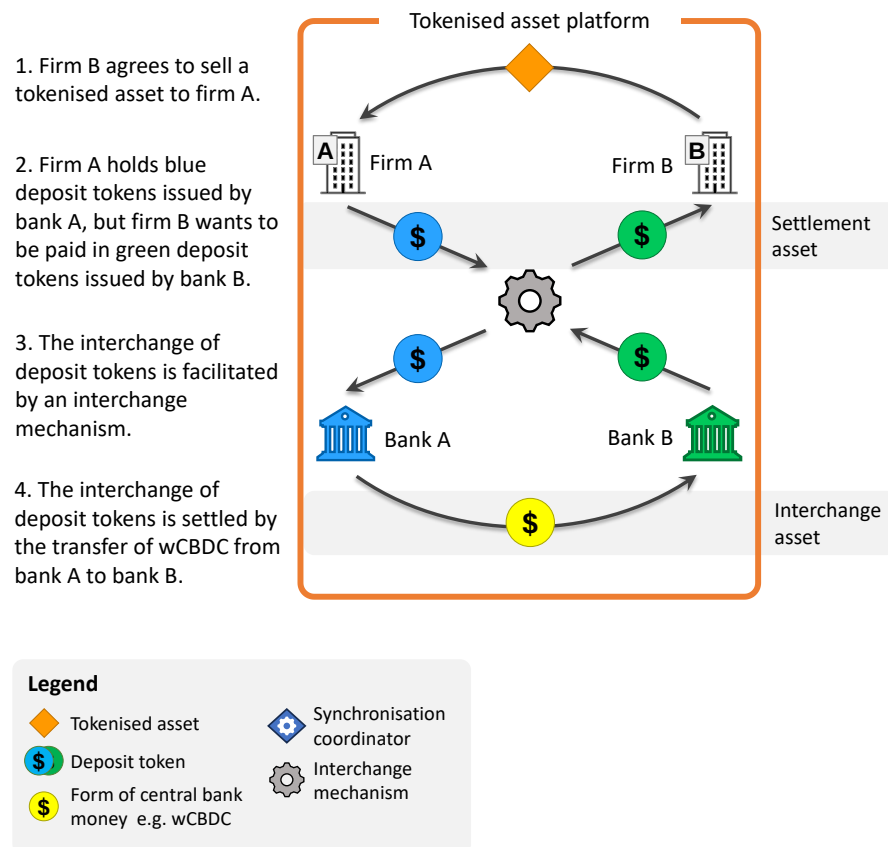


Figure 3: Illustration of ‘Interchange’ Mechanism for Privately Issued Digital Money in the Context of DvP Settlement

In this illustration, the buyer and seller wish to make and receive payment at settlement in deposit tokens issued by their respective banks. The interchange of the deposit tokens is facilitated by the issuing banks using central bank money. In the diagram on the left, the deposit tokens and central bank money exist on the same platform as the tokenised assets, and the settlement process (including interchange of deposit tokens) could occur ‘atomically’. In the diagram on the right, the money and assets exist on different platforms, necessitating some form of orchestration mechanism between the two platforms to ensure DvP settlement (however, in this illustration, the interchange of deposit tokens occurs exclusively on the money platform).



The RBA and DFCRC recognise that no single settlement model may be appropriate for all wholesale markets, and that the forms of digital money that are useful or required in different markets may evolve over time. The objective of Project Acacia is not to identify a single settlement model for all tokenised asset markets for all time, but to ensure that the direction of the RBA and DFCRC's future work is informed by a wide range of inputs, including the views of industry stakeholders. In addition to feedback on the identified settlement models, industry stakeholders are encouraged to provide feedback on the specific technical and functional capabilities that central bank money could possess in a tokenised economy, as well as any alternative settlement models that would support those capabilities.

Questions for industry feedback:

Question 1

What are the key opportunities and challenges of asset tokenisation in wholesale domestic markets? How can the challenges be overcome?

Question 2

What regulatory obstacles exist to an efficient settlement mechanism for wholesale tokenised asset markets, including the development of new forms of money to support this? What solutions do you suggest?

Question 3

Should efforts to support tokenised markets be focused on large existing asset classes or newer ones, and why?

Question 4

What role could central bank money play to best support the development of tokenised asset markets, and what policy and operational questions would such a role pose?

Question 5

What are the most important capabilities or attributes that central bank money would need to have, to realise the potential of tokenisation in wholesale markets? This could include, for example, that central bank money is deployed in a tokenised form directly on tokenised asset ledgers; that it is directly accessible (irrespective of its form) by a wider range of institutions than those who are currently eligible for an ESA; or that it can be transacted outside of normal business hours. Please be specific and rank the capabilities by their relative importance.

Question 6

Are there any settlement models that are **not** encompassed in the 'design space' diagram (Figure 1) above and should be considered in relation to wholesale tokenised asset markets? If so, please outline the models and explain why they are relevant.

Question 7

Do you see a role for privately issued forms of digital money in enabling tokenisation in wholesale markets? If so, what types of privately-issued digital money – for example, deposit tokens, RBDCs or fiat-backed stablecoins – are best suited to play this role, and why? What are the market characteristics that will enable privately issued forms of digital money to be utilised and the design features of such forms to be effective and efficient?

Question 8

While cross-border settlements are not the focus of the current phase of Project Acacia, the RBA and DFCRC are interested in stakeholders' views on which settlement models may be particularly suited for cross-border settlements. Are any of the models better-suited than others to facilitate innovation in cross-border transactions?

3.2 Considerations in evaluating settlement models and their implications

Different settlement models could present different opportunities, costs and risks for individual participants in the relevant markets and the wider financial system. In Phase 1, the RBA and DFCRC sought to identify considerations that could be relevant to a desktop evaluation and comparison of those opportunities, costs and risks. The main considerations that were identified included:

- **Promoting financial stability:** The extent to which the settlement model uses central bank money for settlement where appropriate (e.g. in systemically important markets), to minimise credit and liquidity risks associated with settlement processes.
- **Maintaining the 'singleness of money':** The extent to which the model would maintain at par convertibility of different forms of money denominated in Australian dollars – public and private – to promote certainty and transactional efficiency.
- **Maintaining a two-tier monetary system:** The extent to which the model would maintain the complementary and mutually supporting roles of public and private money, in which central bank money plays a foundational role and private sector financial intermediaries can innovate in the provision of money to meet the needs of end users.
- **Supporting market efficiency and complex use cases:** The extent to which the model offers scope for driving operational efficiency and risk reduction in settlement and related processes and support for more complex token settlement use cases – for example, by utilising programmability of money tokens and enabling atomic settlement, which in turn can support the sequencing of settlement and related processes for execution on an asset platform (so-called 'composability').
- **Minimising complexity, cost and risk:** The extent to which the model leverages existing governance structures, standards or infrastructure, or involves a change in the roles of different stakeholders in settlement and related processes.
- **Management by commercial banks of their liquidity:** The extent to which the model may complicate commercial banks' management of their liquidity by, for example, splitting central bank money into multiple forms (e.g. ESA balances and wholesale CBDC).
- **Optimising technical performance and robustness:** The extent to which the model would affect performance and resilience in a number of non-functional requirement areas – for example, settlement throughput and response time, scalability, data confidentiality, interoperability and security.

Additional considerations, not listed above, could be relevant in evaluating different settlement models at a more detailed level, taking into account model design decisions and operating environment. Those considerations may include the extent to which a settlement model could affect the implementation of monetary policy (through potential effects on demand for central bank money), and legal and regulatory implications.

Question 9

Are there any additional considerations that you believe are relevant to the evaluation of options for settlement in wholesale tokenised asset markets? Which (if any) of the considerations should be prioritised (weighted more heavily)?

3.3 Trade-offs between settlement models

From the range of possible settlement models illustrated in Figure 1, five models were selected for further elaboration in Phase 1, based on their representation of distinct areas of the design space that were considered useful for comparison. The selected models were evaluated using the considerations outlined above, and the results of this work are presented in Appendix B.

Several of the selected models utilise the RBA's existing settlement infrastructure (i.e. RTGS and ESAs). These models involve the tokenised asset platform, or a 'synchronisation coordinator' (refer Section 3.5 below), interfacing with the RBA's settlement infrastructure to coordinate DvP settlement. In those models, the RBA retains exclusive control of a centralised settlement infrastructure and visibility of central bank money balances and transactions at all times. This may be contrasted with other models selected for evaluation, in which central bank money (and privately-issued money) is tokenised and issued on one or more selected third-party platforms on which tokenised assets are recorded and traded. In those models, the role of the central bank is altered – it becomes the issuer of a wCBDC onto an infrastructure that it does not control – and its capacity to manage and monitor balances and transactions in central bank money in the form of wCBDC may be (at best) indirect. These hypothetical models may maximise the scope for refashioning financial market processes, through atomic settlement, programmability of money tokens and composability of settlement and other functions. But they would represent a fundamental change to existing governance arrangements for institutional settlements in central bank money, and hence would pose a range of policy and operational questions that would need careful scrutiny.

This analysis highlights a key trade-off in the selection of settlement models between, on the one hand, maximising the central bank's control over settlement infrastructure and minimising cost and complexity of change for industry by utilising existing settlement infrastructure, and, on the other hand, maximising the potential for efficiency gains and risk reduction in wholesale markets by tokenising central bank and private sector money on the same platform on which tokenised assets are traded.

Applied research in Phase 2 of Project Acacia will provide opportunities to progress understanding of these trade-offs. For instance, the RBA and DFCRC are interested to understand the benefits and risks associated with a deployment model in which the RBA issues a wholesale CBDC directly onto one or more selected third-party tokenised asset platforms, and the controls and requirements that might be needed to effectively manage those risks. Banks that are interested in exploring the issuance of deposit tokens or RBDCs may have a shared interest in this question, depending on the envisaged deployment model.

Question 10

Are there particular trade-offs associated with different tokenised settlement models that you wish to highlight?

3.4 Facilitating settlement across separate money and asset platforms

A settlement model in which money and assets are on different platforms may be the least transformative of the models considered in Phase 1, in terms of enabling the benefits of tokenisation in financial markets. This is because atomic settlement is more difficult to achieve (or infeasible) and the operational efficiencies and other benefits that may be gained through programmability of money and/or assets are likely to be more limited. But if the model utilises existing settlement infrastructure, it may be the most quickly realisable model for tokenised asset markets, and it could provide a foundation for future evolution.

As noted above, a model in which money and assets are on different platforms requires some form of orchestration mechanism between the two platforms to ensure DvP settlement. The concept of a settlement orchestrator (or ‘synchronisation coordinator’) that is responsible for coordinating deliveries and payments across asset platforms and the RTGS system is not novel in the Australian payments system (Box C). A question that may be explored in Phase 2 of Project Acacia is whether there is a case for further evolving the existing model for access to RTGS infrastructure, in a way that encompasses the concept of a synchronisation coordinator for relevant tokenised asset classes and that minimises the need for unique facilities to submit transactions for each asset class.

The Bank of England is working with industry to design a ‘synchronisation’ capability as part of its RTGS renewal program, which would allow RTGS to support the settlement of transactions involving digital assets.¹² Several European central banks are exploring different solutions for synchronisation between existing central bank settlement infrastructure and DLT-based asset platforms as part of the Eurosystem’s exploratory work on new technologies for wholesale central bank money settlement.¹³

The RBA, as the operator of Australia’s RTGS system, is open to exploring a settlement model that involves the synchronisation of deliveries and payments across tokenised asset platforms and existing RTGS infrastructure (refer Model A in Appendix B). Phase 2 of Project Acacia is an opportunity for industry stakeholders to express their interest in participating in that exploration. For clarity, any exploration of such a model in Phase 2 would be based on the RTGS system technology, connectivity and functionality as it exists today, as it is beyond the scope of Project Acacia to engage in a redesign of the system.

Question 11

Could asset tokenisation in wholesale markets be effectively supported by a settlement model that uses a ‘synchronisation coordinator’ to coordinate delivery versus payment across tokenised asset platforms and existing RTGS infrastructure? Do you support the further exploration of a synchronisation coordination function for a potential tokenised economy? If so, what should be the focus of that exploration in the short term? For example, the role, functions and governance of the synchronisation coordinator, the technical channels for interaction between the synchronisation coordinator and the RBA’s infrastructure, or the viability of this model for tokenised asset platforms.

¹² Mills S (2024), ‘[Innovation in Digital Assets in the Financial System and The Bank](#)’, Speech at Digital Assets Week, London, 2 October.

¹³ See European Central Bank: [Exploratory Work on New Technologies for Wholesale Central Bank Money Settlement](#).

Question 12

If tokenised money – public and/or private – was issued directly onto the same platform as tokenised assets, what types of benefits would you expect to arise from settlement on a common platform, compared with settlement using conventional forms of commercial bank money and ESA balances via a synchronisation coordinator? How significant might those benefits be, and to what stakeholder groups would they accrue (e.g. issuers, investors, platform operators)? If your response relates to a specific asset class or use case, please specify.

Box C: Feeder systems and batch administrators in RITS

The Reserve Bank Information and Transfer System (RITS) is Australia's high-value payments system, which is used by banks and other approved institutions to settle their payment obligations on a real-time gross settlement (RTGS) basis. The rules of RITS make provision for the admission of 'feeder systems' to RITS, for settlement of interbank obligations arising in those systems. Transactions from these external feeder systems are settled on a real-time gross basis. The rules also provide that a member of RITS may gain approval as a 'batch administrator', to submit 'batches' of interbank obligations (which may be netted outside of RITS) for simultaneous settlement across ESAs.

Where the settlement obligations submitted to RITS by a feeder system or batch administrator relate to the DvP settlement of asset transactions, the operator of the feeder system or the batch administrator (as applicable) is responsible for coordinating asset deliveries on its external settlement platform and interbank settlements through RITS. In that role, the operator of the feeder system or the batch administrator is fulfilling a functionally similar role to that of the 'synchronisation coordinator' described in one of the settlement models explored in Phase 1 of Project Acacia (refer Model A in Appendix B).

Batch administrators and feeder systems currently authorised to submit settlement obligations for DvP settlements are:

- Property Exchange Australia and ASX Financial Settlements, each of which is a 'batch administrator' for electronic property settlements. They submit interbank settlement obligations to RITS in batches via the Batch Facility, and these can settle from 7.30am to 4.30pm on RITS business days.
- Austraclear operates a 'feeder system' for real-time gross settlement of transactions in Australian Government Securities and other fixed-income instruments held in the Austraclear central securities depository. It submits interbank settlement obligations to RITS via the Austraclear Feeder System, and these can settle from 7.30am to 4.30pm on RITS business days.
- ASX Settlement is the 'batch administrator' of the multilaterally netted settlement batch for Australian equity markets. It submits a single batch of interbank settlement obligations each business day via the Swift Payment Delivery System and this batch typically settles at around midday.

3.5 Interoperability between platforms is an important area of future research

Interoperability is relevant in this analysis in at least two ways:

- between the central bank's settlement infrastructure and tokenised asset platforms (where money and assets exist on different platforms) – this is the subject of the 'synchronisation coordinator', as discussed above
- between asset platforms (e.g. where settling a transaction involving multiple assets recorded on different platforms).

With regard to the latter, it is recognised that multiple token market infrastructures would be likely to exist in a mature tokenised economy. In the absence of a single 'unified ledger' in which 'everything exists in one place',¹⁴ interoperability between asset ledgers would be important. Different approaches to effecting settlement involving multiple assets recorded on different ledgers (platforms) were considered in Phase 1 (refer Appendix B). Further research into these approaches is required.

Question 13

Do you have experience or insights in addressing the challenges of interoperability between asset ledgers that may be relevant to the objectives of Project Acacia?

3.6 Applied research questions

Through Phase 1 of Project Acacia, the RBA and DFCRC have identified specific questions that could be addressed through applied research in collaboration with industry stakeholders in Phase 2. These questions are summarised in Table 2 below.

Question 14

Are there any additional research questions which should be prioritised in Phase 2 of Project Acacia, over and above those described in Table 2 below? If so, please describe them.

¹⁴ BIS (2023), '[Blueprint for the future monetary system: improving the old, enabling the new](#)', BIS Annual Economic Report 2023, 20 June.

Table 2: Potential Research Questions for Phase 2

Business objectives, technology design and risk management
Can tokenised forms of privately issued money – supported by an appropriate interchange mechanism using existing central bank settlement infrastructure – facilitate a similar level of risk reduction and business process efficiency in wholesale financial markets (through atomic settlement, programmability and composability) as a wholesale CBDC?
What are the opportunities, risks and limitations of a deployment model in which the RBA issues a wholesale CBDC directly onto one or more third-party tokenised asset platforms? What are the technology, operational, legal and other risks associated with this deployment model, and how may those risks be controlled adequately? What are the trade-offs of this model relative to a model in which wholesale CBDC is issued on a standalone platform?
In the absence of a single 'unified ledger', interoperability between asset ledgers will be needed in a tokenised economy. What are the options for effecting settlement of tokenised asset transactions involving multiple assets on different ledgers? What are the benefits, risks and trade-offs associated with those options?
Regulation, governance and public interest objectives
In a settlement model with central bank money and assets represented on different ledgers, what governance arrangements should apply to the entity that is responsible for orchestrating the DvP settlement process across those ledgers (the 'synchronisation coordinator')? Regarding access by synchronisation coordinators to the central bank's settlement infrastructure, is there a case for introducing a flexible and generic (standardised) access model, encompassing all relevant tokenised asset classes, that could remove the need for unique facilities to submit transactions to RITS for each asset class?
What regulatory obstacles exist to an efficient settlement mechanism for wholesale tokenised asset markets, including the development of new forms of money to support this?
Are RBDCs capable of serving as a substitute for central bank money in the settlement of wholesale tokenised asset markets? What risks and challenges (if any) might this approach have?

4. Phase 2 – Experimentation

In Phase 2 of Project Acacia, the RBA and DFCRC, in collaboration with selected industry participants, propose to develop and test prototypes of one or more models for settlement of wholesale tokenised asset markets. This exercise will be framed by use cases proposed by industry. This may involve the RBA issuing a pilot wholesale CBDC and/or private sector parties issuing deposit tokens or other forms of tokenised money (e.g. RBDC or stablecoins), depending on the use cases proposed by industry stakeholders and selected for development and testing. It is envisaged that the work would be supported by industry stakeholders, working collaboratively, in roles such as tokenised asset issuers, investors and token platform market operators (among others).

The purpose of Phase 2 is to test some of the findings of the conceptual research in Phase 1 by overlaying the business objectives of industry stakeholders, and to explore more deeply questions of technology design, risk management, governance and regulation associated with one or more of the settlement models evaluated in Phase 1 and/or alternative models nominated by industry participants.

Industry stakeholders are invited to provide feedback on how and where the applied research effort in Phase 2 could be directed, by nominating use cases they have an interest in exploring in collaboration with the RBA and DFCRC and the research questions they wish to focus on.

This section outlines the Phase 2 project scope and exclusions, and the process that the RBA and DFCRC will follow to select industry participants to collaborate with in Phase 2.

The RBA and DFCRC do not intend to set up or make available a simulated or pilot tokenised asset platform or trading venue for Phase 2. Industry participants will need to establish these platforms to suit their needs. One of the potential areas of research the RBA and DFCRC have identified for Phase 2 is to explore a deployment model in which the RBA issues a wholesale CBDC, or a private entity on behalf of a consortium issues an RBDC, directly onto one or more third-party tokenised asset platforms, which could also host privately issued digital money such as deposit tokens or stablecoins.

Industry participants will bear their own costs for the conception, design, development, implementation and execution of their proposed use cases in Project Acacia.

The RBA and DFCRC, in collaboration with relevant regulatory agencies (ASIC, APRA and AUSTRAC, as applicable), will work with interested parties to establish what licences or regulatory relief those parties may need to participate in the project. The intent of the Project Acacia Steering Committee is that licensing and regulatory relief requirements should be addressed in the most efficient way possible, recognising that a research objective of the project is to inform not only the future regulation of tokenised asset markets, but also the future of regulatory ‘sandbox’ arrangements for trialling new forms of financial market infrastructure. Use case proposals will be selected for development and testing and announced by the RBA and DFCRC only after licences or regulatory relief (where required) are obtained.

4.1 Project scope and exclusions

Project Acacia has a domestic wholesale focus in terms of use cases. In this context, ‘wholesale’ refers to use cases involving institutional markets and participants. The latter will encompass institutions that participate in those markets, directly or indirectly, as issuers, investors, intermediaries or other institutional stakeholders. The project will not be confined to financial institutions that are eligible to hold an ESA at the RBA.

The RBA and DFCRC are aware of the interest of many industry stakeholders in the potential applications of a CBDC in cross-border payments. Several international projects are investigating (or recently have investigated) the role that new forms of money could play in cross-border payments. An example is Project Dunbar, in which the RBA collaborated with the BIS Innovation Hub and three other central banks in 2021–2022.¹⁵ Phase 2 of Project Acacia is intended to focus on domestic markets; however, a later phase could examine the role that new forms of digital money could play in improving cross-border payments and settlements, as recently outlined by the RBA and Treasury in a roadmap of selected CBDC research initiatives.¹⁶ This is also a matter on which the Industry Advisory Group for Project Acacia could consider making recommendations in regards to future research opportunities at the conclusion of Phase 2.

Industry stakeholders who have an interest in exploring use cases that may not be within the scope of Phase 2 of Project Acacia – for example, use cases that are focused on servicing the retail market, or which are primarily concerned with cross-border payments – are still encouraged to express their interest, as there may be opportunities to pursue those in a later phase or with the DFCRC outside of Project Acacia.

4.2 Process for selection of industry participants and project timeline

The RBA and DFCRC’s intent is to maximise industry participation in Phase 2 within the constraints of the project scope, objectives and timetable. The milestone dates for each of the steps below are **indicative and subject to change**.

4.2.1 Step 1: Interested parties submit expressions of interest

Industry stakeholders who wish to express their interest in contributing to the research in Phase 2 are invited to do so by submitting an expression of interest (EOI) using the Response Template in Appendix A (see Part 2) by **Wednesday, 11 December 2024**. If two or more industry stakeholders wish to express interest in a joint collaboration on the same use case, they may submit a single (joint) EOI.

The Response Template seeks input on the use cases, forms of digital money and settlement models that industry stakeholders are interested in exploring. A detailed scoping of the use case(s) is **not** required at this stage. The RBA and DFCRC will use the information provided in the EOIs to select industry participants to submit more detailed use case proposals, as outlined in Step 2 below.

The RBA and DFCRC encourage interested industry stakeholders to consider, at an early stage, what (if any) licence(s) – or regulatory relief from the requirement to hold a licence – they may need to execute their use case (if selected). It is **not** expected that stakeholders who express interest should by this stage have carried out a detailed regulatory compliance assessment of their proposed use case. However, those stakeholders who anticipate that they may require licensing or other regulatory relief are encouraged to identify themselves to the RBA and DFCRC at the earliest opportunity. This will assist the relevant

¹⁵ BIS Innovation Hub (2022), ‘[Project Dunbar – International settlements using multi-CBDCs](#)’, March.

¹⁶ RBA and Treasury (2024), ‘[Central Bank Digital Currency and the Future of Digital Money in Australia](#)’, September.

regulatory agencies to identify licensing and regulatory relief requirements that are common to multiple interested parties, and to seek to address those requirements in the most efficient way possible.

Industry stakeholders who have an interest in participating in applied research in Phase 2 but lack the means to develop and test their nominated use case from end to end, are encouraged to express their interest as the project may offer opportunities to identify suitable collaboration partners.

The RBA and DFCRC welcome engagement with industry stakeholders during the consultation period. All enquiries should be directed to **ProjectAcacia@rba.gov.au**.

4.2.2 Step 2: Selected parties invited to submit more detailed use case proposals

In mid-December 2024, the RBA and DFCRC plan to select and notify the interested parties who will be invited to submit more detailed use case proposals. The detailed use case proposals will be due by February 2025. The RBA and DFCRC will engage with the selected parties during this period to discuss the business, technical and regulatory aspects of their use case proposals.

The RBA and DFCRC will use the EOIs to select interested parties to submit more detailed use case proposals. The selection will be at the discretion of the RBA and DFCRC and will be guided by the following considerations:

- The level of alignment between the nominated use case(s) and the domestic Australian and wholesale focus of Project Acacia.
- The interested party's connection with the market to which its nominated use case relates, which may be demonstrated in different ways – for example, the interested party may be an issuer, investor, intermediary or other participant in the relevant market, or it may supply services (such as technology, financial or consulting services) that facilitate participation by others in the relevant market.

An invitation to submit a detailed use case proposal will not be a guarantee of selection to develop and test the use case in Project Acacia – refer Steps 3 and 4 below.

4.2.3 Step 3: RBA and DFCRC engage with selected parties on detailed use case proposals, including consideration of regulatory implications

From February to March 2025, the RBA and DFCRC will engage with selected parties on their detailed use case proposals. This will include consideration of the regulatory implications of the proposals.

It is anticipated that there should be flexibility within the project to test selected use cases as either a pilot (involving real assets and money) or proof of concept (involving simulated assets and money), depending on the needs of the use case and as agreed with the RBA and DFCRC. Engagement in this Step 3 is intended to assist interested parties to decide which of these routes they may wish to pursue.

4.2.4 Step 4: Use cases selected for exploration in Phase 2

From April 2025, the RBA and DFCRC will complete their assessment of the detailed use case proposals and will select the use cases to be developed and tested as part of Phase 2. The selection and announcement of use case proposals will occur only after finalisation of licences or regulatory relief (where required).

The selection of use case proposals will be at the discretion of the RBA and DFCRC, with input from other regulatory agencies (ASIC, APRA and AUSTRAC, as relevant), and will be guided by considerations such as:

- the use case's potential to contribute to the research aims of Project Acacia (including the questions flagged in Table 2)
- the potential economic impact of the use case, including benefits and costs
- the interested party's capacity to develop and test the use case within the project timeframe
- the finalisation of licences or regulatory relief (where required).

5. Industry Advisory Group

The RBA and DFCRC intend to establish an 'Industry Advisory Group' of selected industry experts, to support Phase 2 of Project Acacia. The Industry Advisory Group will receive periodic updates on Project Acacia and will have an important role providing advice on the project pathway, findings and future research opportunities. It will be an advisory forum and will not make decisions with respect to the management or running of the project. It will be chaired by a representative of the DFCRC and will report to the Project Acacia Steering Committee.

It is intended that experts from different fields (e.g. technology, operations, strategy and regulation) and with experience in different segments of relevant markets (e.g. product issuers, platform operators, banks, custodians and investors) should be represented on the Industry Advisory Group. The RBA and DFCRC intend to select members of the group from nominations received having regard to nominees' capacity to support the aims of Project Acacia. However, they reserve the right to appoint members to the group outside the nomination process outlined below.

An individual is eligible for appointment to the Industry Advisory Group irrespective of whether the organisation they are employed by, or otherwise associated with, has expressed interest in participating in Phase 2 of Project Acacia. To assist with the management of potential conflicts of interest, the Industry Advisory Group will not be involved in selecting the use cases to be explored as part of Phase 2.

Membership of the Industry Advisory Group is for the duration of 2025 and will not be remunerated. A formal charter for the group will be made available to those nominees who are selected for membership.

Individuals who have relevant expertise and are willing to commit to membership of the Industry Advisory Group for the duration of 2025, should express their interest by completing Part 3 of the Response Template in Appendix A and submitting it by **11 December 2024**. All expressions of interest will be received in confidence.

The RBA and DFCRC plan to announce the membership of the Industry Advisory Group in March 2025, with the first meeting of the group to occur soon after that.

Glossary

Atomic settlement: A process where settlement occurs in an integrated fashion, such that it is technologically infeasible for one leg of a transaction to occur without the other.

Automated market maker or AMM: A type of decentralised exchange, common in DeFi ecosystems. They use smart contracts and liquidity pools to facilitate trading. Entities wishing to earn a return from their asset holdings can contribute liquidity by making their assets available on an AMM (for which they earn fees), and entities wishing to trade can source liquidity by buying assets from pools held by the AMM (for which they pay fees). Prices are determined by mathematical formulae and the relative size of the pools.

Central bank digital currency or CBDC: A form of digital money that is a direct liability of the central bank, and that may be distinguished from existing forms of digital central bank money by the form of technology it uses.

Deposit token or DT: A tokenised form of commercial bank money backed by the balance sheet of a prudentially regulated bank. In this paper, it is assumed that deposit tokens can only be held by a customer of the issuing bank.

DvP settlement: A securities settlement regime in which the delivery of securities and payment of funds are conditional upon one another such that delivery occurs if and only if payment occurs.

ESA balance: A form of digital money issued by the RBA and represented by the balance of funds in a financial institution's Exchange Settlement Account (ESA), which is available to meet settlement obligations to other ESA holders.

Exchange Settlement Account or ESA: An account held at the RBA by an eligible financial institution or payments service provider to settle financial obligations arising in the clearing process.

Fast Settlement Service or FSS: A service of RITS, developed and operated by the RBA, which supports the settlement of payments through the New Payments Platform between financial institutions 24/7.

Interchange: As part of DvP settlement, the exchange of a privately-issued form of digital money tendered by the buyer into another privately-issued form of digital money that the seller is capable of holding. A publicly backed form of money may be required to mediate the exchange to ensure that the singleness of money is maintained. This process may be facilitated by the financial institutions that issue those forms of digital money, or by a third-party holding liquidity in both and acting as a market maker.

Real-time gross settlement or RTGS: The settlement of obligations on a line-by-line basis, without netting.

Reserve Bank Information and Transfer System or RITS: Australia's high-value settlement system, which is used by banks and other approved institutions to settle their payment obligations. Final and irrevocable settlement is achieved by the simultaneous crediting and debiting of ESAs held at the RBA.

Reserves-backed digital currency or RBDC: A tokenised form of money issued by a private sector entity (possibly an industry consortium) that is fully backed by central bank money held by the entity in an omnibus account at the central bank. It is not a liability of the central bank at which the reserves are held.

Stablecoin: In this paper, ‘stablecoin’ refers to a tokenised form of privately issued money that is intended to maintain a stable value relative to a particular fiat currency, issued by an entity that is licensed to issue a stablecoin, and backed by assets that are denominated in the relevant fiat currency.

Synchronisation coordinator: An entity that is responsible for coordinating deliveries and payments such that settlement occurs on a DvP basis, in a settlement model in which money and assets are recorded on different platforms.

Wholesale CBDC or wCBDC: A central bank digital currency that may only be held by a limited range of entities for use in institutional payment and settlement systems.

Appendix A: Consultation Response Template

Please complete Parts 1, 2 and 3 (as applicable) and send to ProjectAcacia@rba.gov.au.

An editable version of this Response Template is available at <https://www.rba.gov.au/payments-and-infrastructure/central-bank-digital-currency/wholesale-central-bank-digital-currency.html>

Part 1 – Consultation questions

Questions for industry feedback:

Question 1

What are the key opportunities and challenges of asset tokenisation in wholesale domestic markets? How can the challenges be overcome?

Question 2

What regulatory obstacles exist to an efficient settlement mechanism for wholesale tokenised asset markets, including the development of new forms of money to support this? What solutions do you suggest?

Question 3

Should efforts to support tokenised markets be focused on large existing asset classes or newer ones, and why?

Question 4

What role could central bank money play to best support the development of tokenised asset markets, and what policy and operational questions would such a role pose?

Question 5

What are the most important capabilities or attributes that central bank money would need to have, to realise the potential of tokenisation in wholesale markets? This could include, for example, that central bank money is deployed in a tokenised form directly on tokenised asset ledgers; that it is directly accessible (irrespective of its form) by a wider range of institutions than those who are currently eligible for an ESA; or that it can be transacted outside of normal business hours. Please be specific and rank the capabilities by their relative importance.

Question 6

Are there any settlement models that are **not** encompassed in the 'design space' diagram (Figure 1) above and should be considered in relation to wholesale tokenised asset markets? If so, please outline the models and explain why they are relevant.

Question 7

Do you see a role for privately issued forms of digital money in enabling tokenisation in wholesale markets? If so, what types of privately-issued digital money – for example, deposit tokens, RBDCs or fiat-backed stablecoins – are best suited to play this role, and why? What are the market

characteristics that will enable privately issued forms of digital money to be utilised and the design features of such forms to be effective and efficient?

Question 8

While cross-border settlements are not the focus of the current phase of Project Acacia, the RBA and DFCRC are interested in stakeholders' views on which settlement models may be particularly suited for cross-border settlements. Are any of the models better-suited than others to facilitate innovation in cross-border transactions?

Question 9

Are there any additional considerations that you believe are relevant to the evaluation of options for settlement in wholesale tokenised asset markets? Which (if any) of the considerations should be prioritised (weighted more heavily)?

Question 10

Are there particular trade-offs associated with different tokenised settlement models that you wish to highlight?

Question 11

Could asset tokenisation in wholesale markets be effectively supported by a settlement model that uses a 'synchronisation coordinator' to coordinate delivery versus payment across tokenised asset platforms and existing RTGS infrastructure? Do you support the further exploration of a synchronisation coordination function for a potential tokenised economy? If so, what should be the focus of that exploration in the short term? For example, the role, functions and governance of the synchronisation coordinator, the technical channels for interaction between the synchronisation coordinator and the RBA's infrastructure, or the viability of this model for tokenised asset platforms.

Question 12

If tokenised money – public and/or private – was issued directly onto the same platform as tokenised assets, what types of benefits would you expect to arise from settlement on a common platform, compared with settlement using conventional forms of commercial bank money and ESA balances via a synchronisation coordinator? How significant might those benefits be, and to what stakeholder groups would they accrue (e.g. issuers, investors, platform operators)? If your response relates to a specific asset class or use case, please specify.

Question 13

Do you have experience or insights in addressing the challenges of interoperability between asset ledgers that may be relevant to the objectives of Project Acacia?

Question 14

Are there any additional research questions which should be prioritised in Phase 2 of Project Acacia, over and above those described in Table 2? If so, please describe them.

Part 2 – Expression of interest in participating in Phase 2 of Project Acacia

Required information	
Name of organisation:	
Place of incorporation and address of main office in Australia:	
Description of organisation:	
Contact person name, role title, email and phone details:	
Brief outline of use case, including asset class:	<i>E.g. primary market issuance, trading and redemption of a short-term debt instrument issued by an ADI.</i>
Are all actors in the use case (issuer, investors, transaction parties etc) wholesale entities (e.g. financial institutions, institutional investors, corporates)?	
Please outline briefly the nature of your organisation's connection with the market to which this use case relates – for example, is your organisation an issuer, investor, intermediary or other participant in the market, or a supplier of services that facilitate participation in the market by others (such as technology, financial or consulting services)?	
In this use case, are asset tokens issued and traded on a private permissioned DLT platform or public DLT platform?	
Please describe the settlement model(s) and form(s) of digital money you wish to explore as part of your proposed use case. As part of this, please nominate the settlement cycle in your use case (e.g. real-time gross settlement, deferred net settlement on T+n).	<i>E.g. asset token transactions settled on a real-time gross basis using [specify settlement asset, e.g. deposit tokens], with interchange using [specify interchange asset, e.g. ESA balances or wCBDC].</i>
What specific research questions do you wish to address through participation in Phase 2?	<i>These may be research questions identified by the RBA and DFCRC (as summarised in Table 2 of the consultation paper) or other questions that you have identified.</i>
Do you wish to develop and test this use case in Phase 2 (as either a pilot or proof of concept), or do you wish to contribute through desk-level research into this use case?	
If you wish to develop and test this use case in Phase 2 and are selected to do so: • Do you anticipate collaborating with other organisations? • To the extent the settlement model you wish to explore involves settlements in central bank money (e.g. ESA balances or wCBDC), is it important to the objectives of your proposal that this should be a real claim on the RBA?	<i>Please indicate the names and/or types of organisations you may collaborate with, and outline their respective potential roles in the collaboration (e.g. issuer, investor, asset platform operator etc).</i>
Do you anticipate that you may need any licence(s), or regulatory relief from the requirement to hold a licence, to execute the proposed use case? If so, please describe briefly.	
Do you anticipate you may need regulatory relief in relation to any other issues (e.g. client money rules, disclosure obligations) to execute the proposed use case? If so, please describe briefly.	
Are there any other considerations that you would like to highlight?	

Part 3 – Expression of interest in joining Industry Advisory Group for Project Acacia

Required information
Name:
Contact (email and phone) details:
Please list your current professional activities (including paid employment, consultancies, directorships, professional memberships currently held).
Are you associated with any organisation that – to your knowledge – has submitted or plans to submit an expression of interest in participating in Phase 2 of Project Acacia? If so, please identify the organisation and describe the nature of the association.
Please briefly outline the skills and expertise you would bring if you were appointed to the Industry Advisory Group and how this would support the aims of Project Acacia.
Do you have any brief comments on the scope and plans for Project Acacia that may be useful to the RBA and DFCRC as they consider proposed use cases and how Phase 2 should proceed?

Appendix B: Evaluation of Selected Settlement Models in Phase 1 of Project Acacia

This Appendix provides an overview of the settlement models selected for evaluation in Phase 1 of Project Acacia and the results of that evaluation. Phase 1 was an initial desktop research phase to identify different ways that tokenised asset transactions could be settled. The focus was on exploring how different forms of digital money and associated infrastructure could facilitate the delivery vs payment (DvP) settlement of tokenised asset transactions.

Selection of settlement models for evaluation

From the range of possible settlement models illustrated in Figure 1 in Section 3 of this paper, five models were selected for further elaboration and evaluation, based on their representation of distinct areas of the design space that were considered useful for comparison. These settlement models are represented in Figure 4 and described in Table 3, below. End-to-end process flow diagrams for each model are at the end of this Appendix in Figure 5. The comments in Table 3 with respect to implementation considerations for each model are indicative only and not based on a systematic feasibility assessment.

Insofar as the selected models involve the RBA issuing a CBDC, for the purposes of this research this is assumed to occur through issuance directly onto one or more third-party tokenised asset platforms (Models B and E). This deployment model differs from that adopted in the RBA and DFCRC's 2022–23 CBDC pilot project, in which a standalone CBDC platform controlled by the RBA was utilised. In the context of the DvP settlement use case, the implications of issuing a CBDC on a platform that is separate from ESA balances, but still controlled by the RBA, are likely to be similar to those associated with the use of ESA balances for tokenised settlement (i.e. Model A).

The five settlement models explored in Phase 1 are intended to be an aid to analysis and understanding of the research problem in Project Acacia. They are not intended to represent a menu of options that the RBA is willing to support or to constrain the range of models that could be considered in Phase 2 of the project.

In the evaluation it was assumed, for the settlement models that use privately issued forms of money as the DvP settlement asset, that this settlement asset would be either a deposit token or RBDC. The RBA and DFCRC are also open to considering whether, and under what conditions, appropriately regulated privately issued stablecoins could play a role as a DvP settlement asset in wholesale tokenised asset markets.

Figure 4: Settlement Models A–E Selected for Evaluation

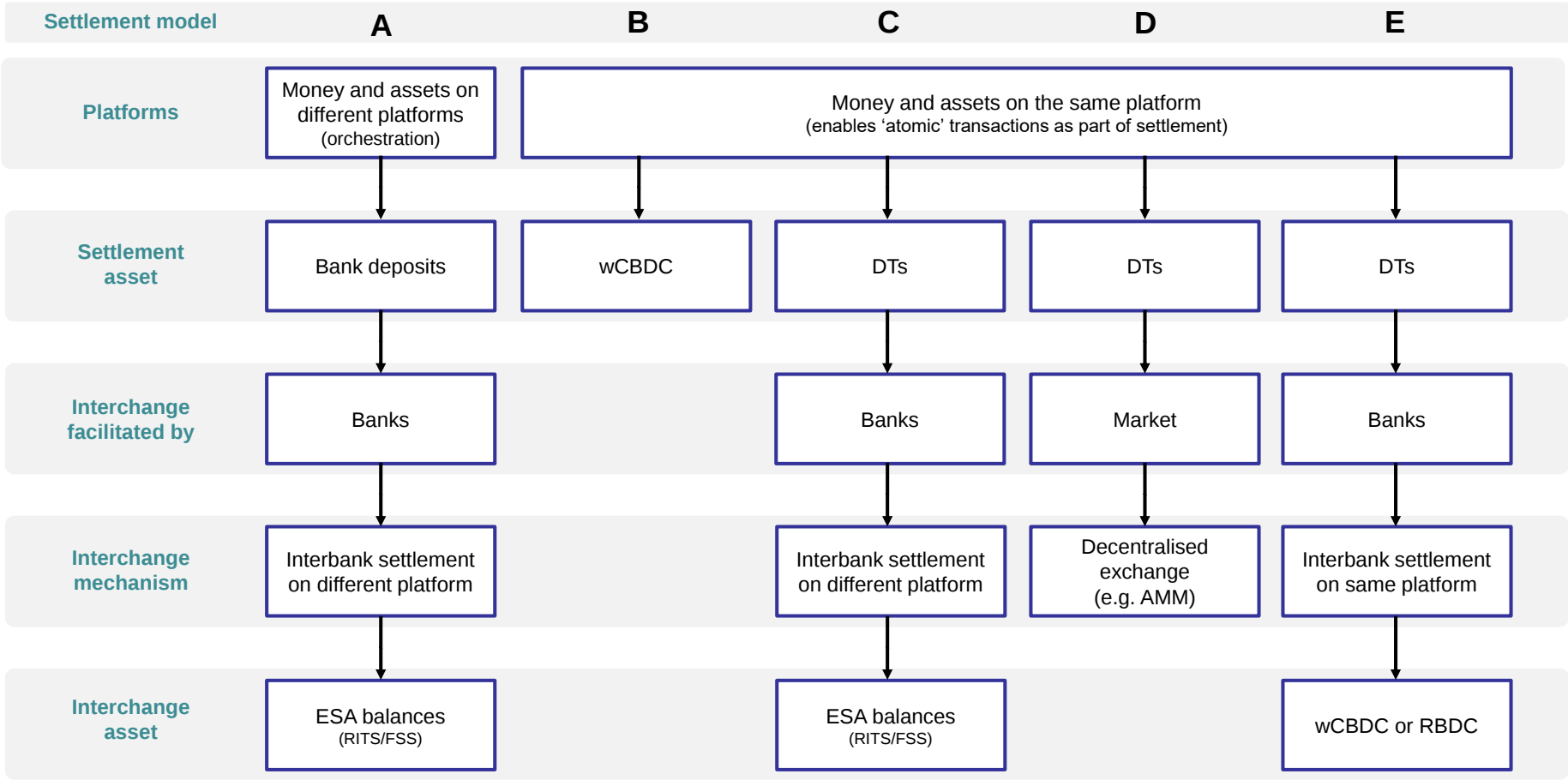


Table 3: Overview of the Five Selected Settlement Models

	Model A	Model B	Model C	Model D	Model E
Money and asset required for DvP settlement on same or different platforms	Different platforms: A 'synchronisation coordinator' orchestrates DvP settlement across platforms by locking the money (on RTGS platform) or the asset (on tokenised asset platform)	Same platform (tokenised asset platform): The transaction processing features of the tokenised asset platform can be used to effect 'atomic' DvP settlement			
Settlement asset	Commercial bank money (deposits)	wCBDC	Deposit tokens	Deposit tokens	Deposit tokens
Interchange mechanism	Bank-facilitated (off the tokenised asset platform)	N/A	Bank-facilitated (off the tokenised asset platform)	Market-facilitated	Bank-facilitated (on the tokenised asset platform)
Interchange asset	ESA balances	N/A	ESA balances	N/A: DvP settlement assets are interchanged via a third-party holding liquidity in both	wCBDC or RBDC
Description	It is assumed that funds for settlement would be drawn from the commercial bank accounts of buyers, and deposited to the commercial bank accounts of sellers, in near-real time with DvP settlement, using 'pull payment' authorisations (e.g. PayTo). To facilitate fast settlements 24/7, access to ESAs for interchange may be via an integration with the FSS instead of the high-value RTGS feeder systems for RITS.	It is assumed that wCBDC would be issued on the tokenised asset platform and all participants on the platform could hold the wCBDC. An alternative approach, not considered in Phase 1, would be for only commercial banks to be able to hold wCBDC and to facilitate settlement using the wCBDC on behalf of their customers (who are not able to hold wCBDC directly).	This model builds on model A by substituting deposit tokens as the DvP settlement asset. Access to ESAs for interchange of DTs may be via an integration with the FSS. DvP settlement could be sequenced before or after interchange. Alternatively, DvP settlement and interchange could be made mutually conditional by 'locking' money and assets on the tokenised asset platform pending settlement of interchange.	DTs may be exchanged directly on the tokenised asset platform via a decentralised exchange (e.g. an AMM with a pool of DTs issued by buyer's and seller's commercial banks).	This model builds on model B by substituting deposit tokens as the DvP settlement asset, and utilising central bank money (or RBDC) for interchange on the same platform. Where wCBDC is utilised as the interchange asset, only ESA holders would hold or transact in wCBDC.
Similar international research projects	The 'trigger platform' trialled by the Bundesbank and the 'synchronisation orchestrator' demonstrated in the BIS's Project Meridian are both examples of settlement coordination platforms.	This model is similar to the Swiss National Bank's Project Helvetia III where central bank money in the form of a CBDC has been minted onto the SDX platform, which also contains tokenised bonds.			This is similar to the BIS's 'Unified Ledger' concept currently being explored as part of Project Agorá.

Settlement model evaluation and findings

The five selected settlement models, framed by a limited number of use cases, were then subject to desktop evaluation against a range of considerations (refer Section 3 of the paper). This evaluation was necessarily quite high level and was based on judgement and assumptions about model design and operating environment, neither of which are fixed. It was intended to provide an initial sense of the implications of the different models that could guide future decisions on whether and how to explore these models in greater detail as part of Phase 2 of Project Acacia.

To frame the evaluation, two use cases deemed to be illustrative of a range of potential activities in wholesale tokenised asset markets were considered:

- **Bilateral trade:** Completing the sale of a tokenised asset between two institutions who have already agreed on a price.
- **Automated Market Maker:** Buying or selling a tokenised asset from or to a decentralised exchange implemented by an AMM.¹⁷

The two use cases were intended to reflect different levels of complexity in DvP settlement and functions in a token market infrastructure.

The settlement models were evaluated against the identified considerations on an end-to-end transaction basis. It was assumed that not all institutions transacting in wholesale tokenised asset markets would have direct access to central bank money (ESAs or wCBDC). Buyers and sellers of tokenised assets would – as part of the process of completing the transaction – acquire and redeem the relevant DvP settlement asset for the settlement model under consideration (including any minting and burning of money tokens) using their commercial bank deposits, and it was assumed that buyers and sellers hold accounts at different commercial banks.

The findings of the desktop evaluation of the selected settlement models are presented in a summarised form in Table 4.

¹⁷ An ‘automated market maker’ is a type of decentralised exchange, common in DeFi ecosystems. They use smart contracts and liquidity pools to facilitate trading of tokenised assets. Entities wishing to earn a return from their asset holdings can contribute liquidity by making their assets available on an AMM (for which they earn fees), and entities wishing to trade can source liquidity by buying assets from pools held by the AMM (for which they pay fees). Prices are determined by mathematical formulae and the relative size of the pools.

Table 4: Summary of Findings of Phase 1

	Model A	Model B	Model C	Model D	Model E
Model description	Money and assets on different platforms, DvP settlement using commercial bank deposits is coordinated across platforms and interchange uses ESA balances	Money and assets on same platform, DvP settlement using wCBDC	Money and assets on same platform, DvP settlement using DTs, interchange of DTs occurs off the asset platform using ESA balances	Money and assets on same platform, DvP settlement using DTs, interchange is facilitated by a third-party holding liquidity in both DTs	Money and assets on same platform, DvP settlement using DTs, interchange also occurs on the asset platform using wCBDC or RBDC
Summary of findings	Makes greater use of existing infrastructure (e.g. FSS, ESAs) Less likely to require significant changes to regulation or policy (e.g. access to ESAs) Fewer inter-system interactions may result in better settlement throughput and latency (no on- or off-ramping into or out of tokenised money, and no interchange between different money tokens – interchange of commercial bank money occurs through existing highly performant infrastructure) Atomic settlement is more difficult to achieve (or infeasible) given money and assets on different platforms Unable to support more complex use cases (e.g., AMM) which rely on money and assets being on the same platform	Changes the central bank's role from operator of a centralised infrastructure to issuer of wCBDC on third-party platform(s) More likely to require significant changes to regulation and/or policy (e.g. who can hold wCBDC, requirements for third-party platform providers) Fragments commercial banks' liquidity in central bank money Rates less highly than Model A for settlement throughput and latency due to on and off-ramping, but this may be mitigated if buyers and sellers held 'tokenised money' as a matter of course Rates more highly than Models C – E for settlement throughput and latency, as a single settlement asset avoids need for interchange Maximises potential efficiency gains and risk reduction through atomic settlement, programmability of wCBDC and composability	Privately issued tokenised money requires industry investment and supports innovation The model could be implemented by sequencing DvP settlement (on the asset platform) before or after interchange (via FSS), and these alternatives may carry risks for the transaction parties (buyer and seller) or the banks that facilitate interchange Rates less highly than Model A for settlement throughput and latency due to on- and off-ramping associated with DT interchange Better support than Model A for realising potential risk reduction and efficiency gains (but less than Models B and E) May offer more flexibility than Model A for different token market business models as central bank and commercial bank settlement options are possible	Privately issued tokenised money requires industry investment and supports innovation Supports more complex token settlement use cases and potential efficiency gains and risk reduction from tokenisation of money Lacks scalability for systemically important markets, due to absence of settlement in central bank money May undermine 'singleness of money' as a purely market-based interchange mechanism may result in privately issued settlement assets trading at a discount or premium to central bank money	Privately issued tokenised money requires industry investment and supports innovation May fragment commercial banks' liquidity in central bank money to a lesser extent than Model B as wCBDC is used for interchange only Rates less highly than Model B for settlement throughput and latency due to need for DT interchange May offer more flexibility than Model B for different token market business models as central and commercial bank settlement options are possible

The evaluation of settlement models in Phase 1 assumed a simplified environment in which there was a single tokenised asset platform. It is recognised that multiple token market infrastructures would be likely to exist in a mature tokenised economy. Different approaches to effecting settlement in a transaction involving multiple assets recorded on different ledgers (platforms) were considered in Phase 1. These were:

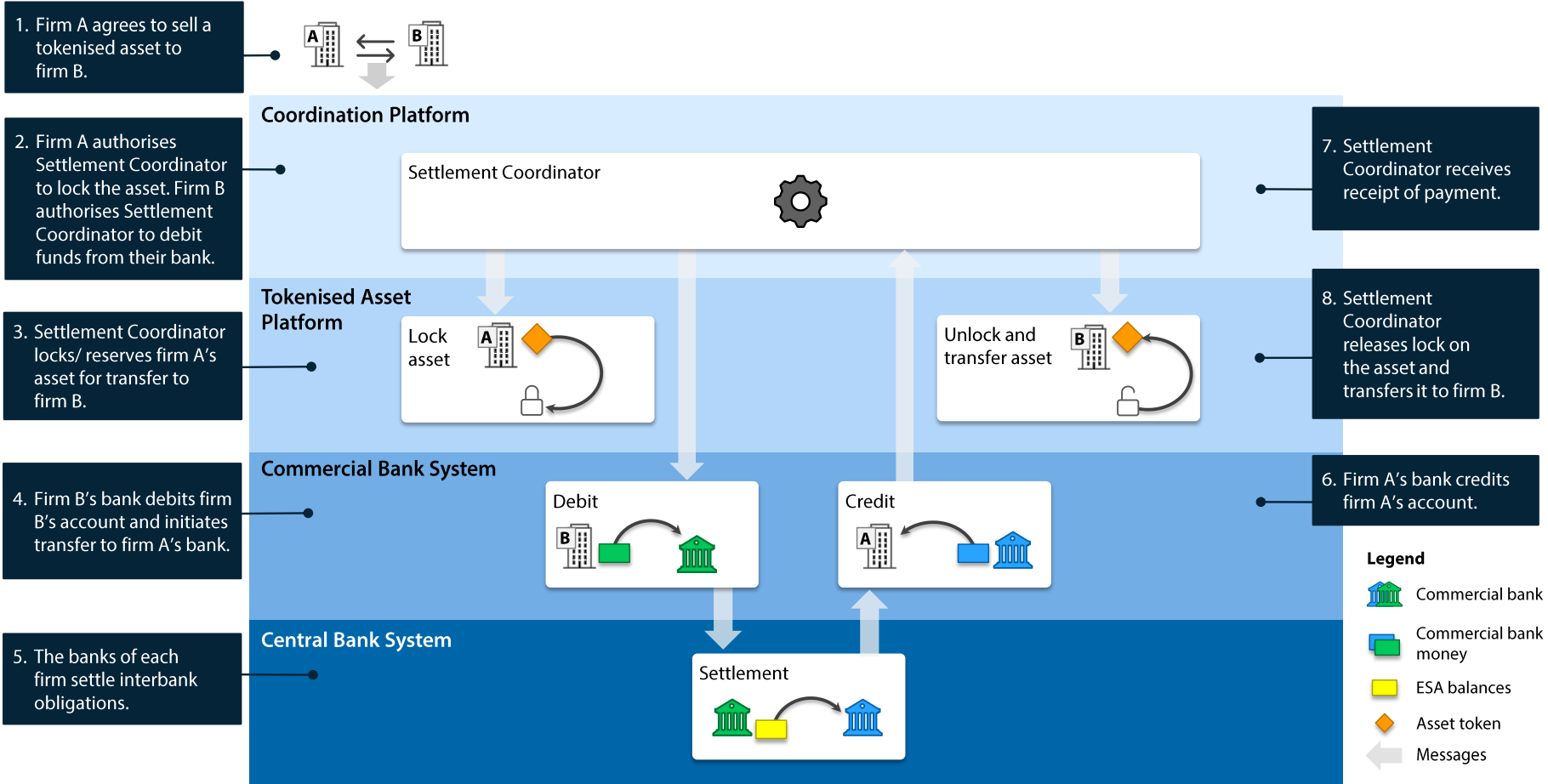
- **Bridging:** Assets that begin on different ledgers are issued/wrapped onto a common ledger for the purposes of settlement. It is assumed that the target ledger has access to a settlement asset (e.g. deposit tokens). Bridging to a target ledger enables the robust implementation of DvP settlement atomically.
- **Coordination:** An intermediary system coordinates settlement between assets that remain on their respective ledgers. This relies on mechanisms that involve each ledger providing some way to guarantee safe settlement of their leg of the transaction to the intermediary. While this can achieve DvP settlement, it is not atomic (in the strict sense of that term).

The challenge of effecting settlements involving multiple asset ledgers and potential solutions is an area of further research interest for the RBA and DFCRC.

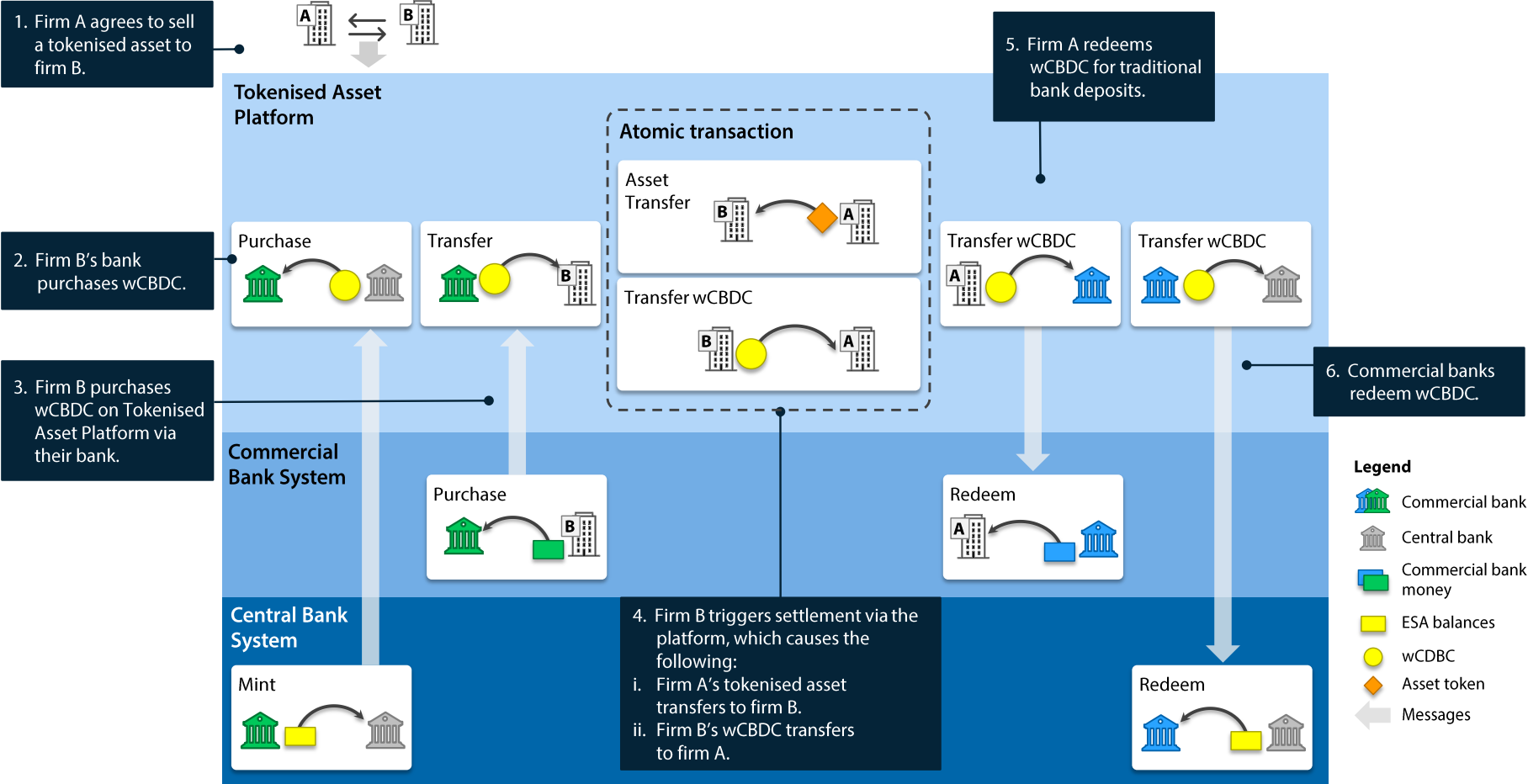
It is also noted that the existence of multiple infrastructures for tokenised markets could magnify some of the issues around certain settlement models highlighted by the Phase 1 evaluation. For example, the liquidity fragmentation effects of Model B would be magnified by the distribution of central bank money, in the form of a wholesale CBDC, into institutional end-users' wallets on each supported asset ledger (assuming a broader range of institutional end users than those that currently hold ESAs at the RBA). It also may magnify the risk and governance challenges associated with the hypothetical issuance of a wholesale CBDC on multiple third-party platforms, in Models B and E.

Figure 5: Explanatory Flow Charts for Settlement Models A–E

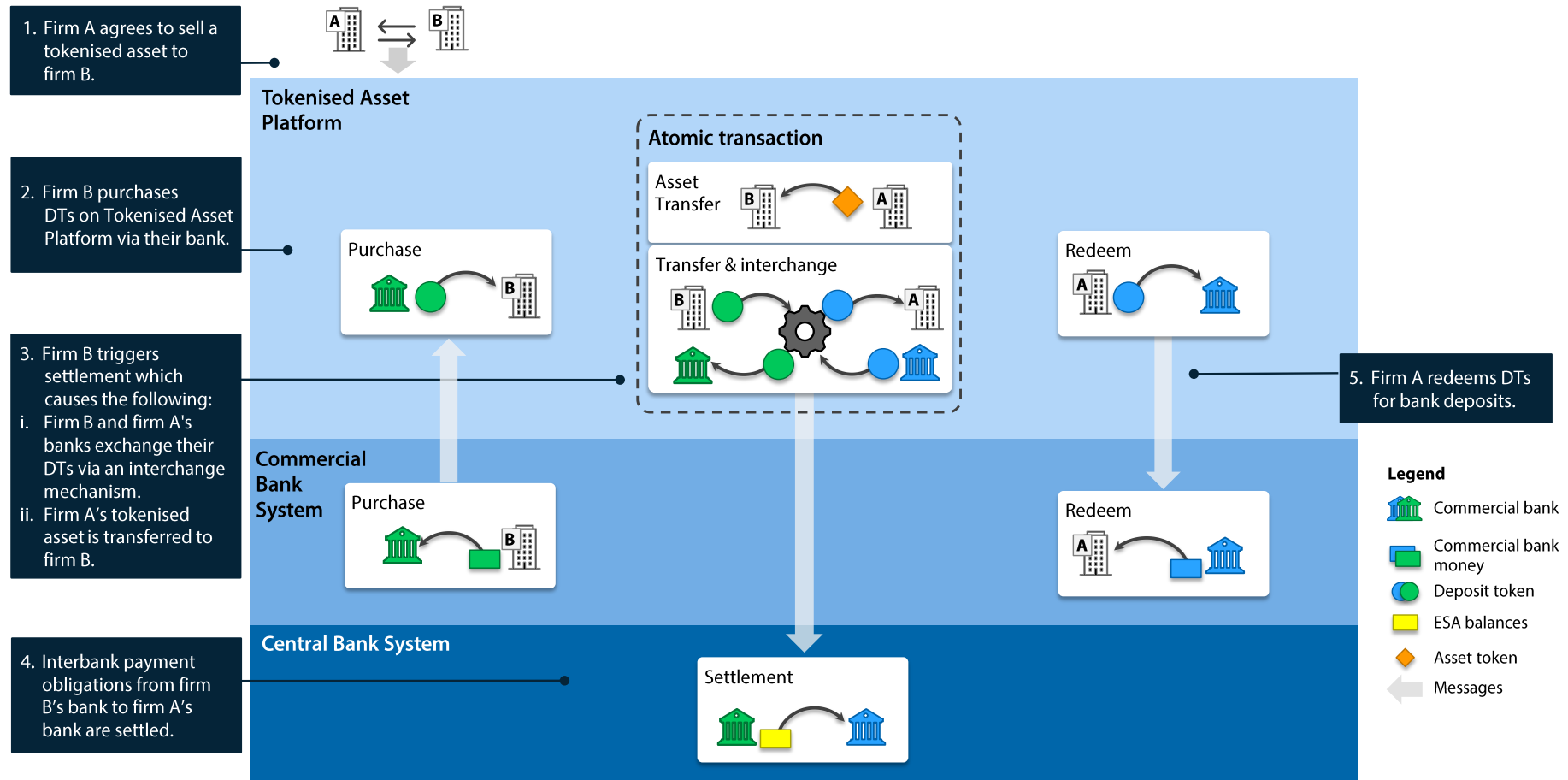
Model A: Money and assets on different platforms, settlement in ESA balances



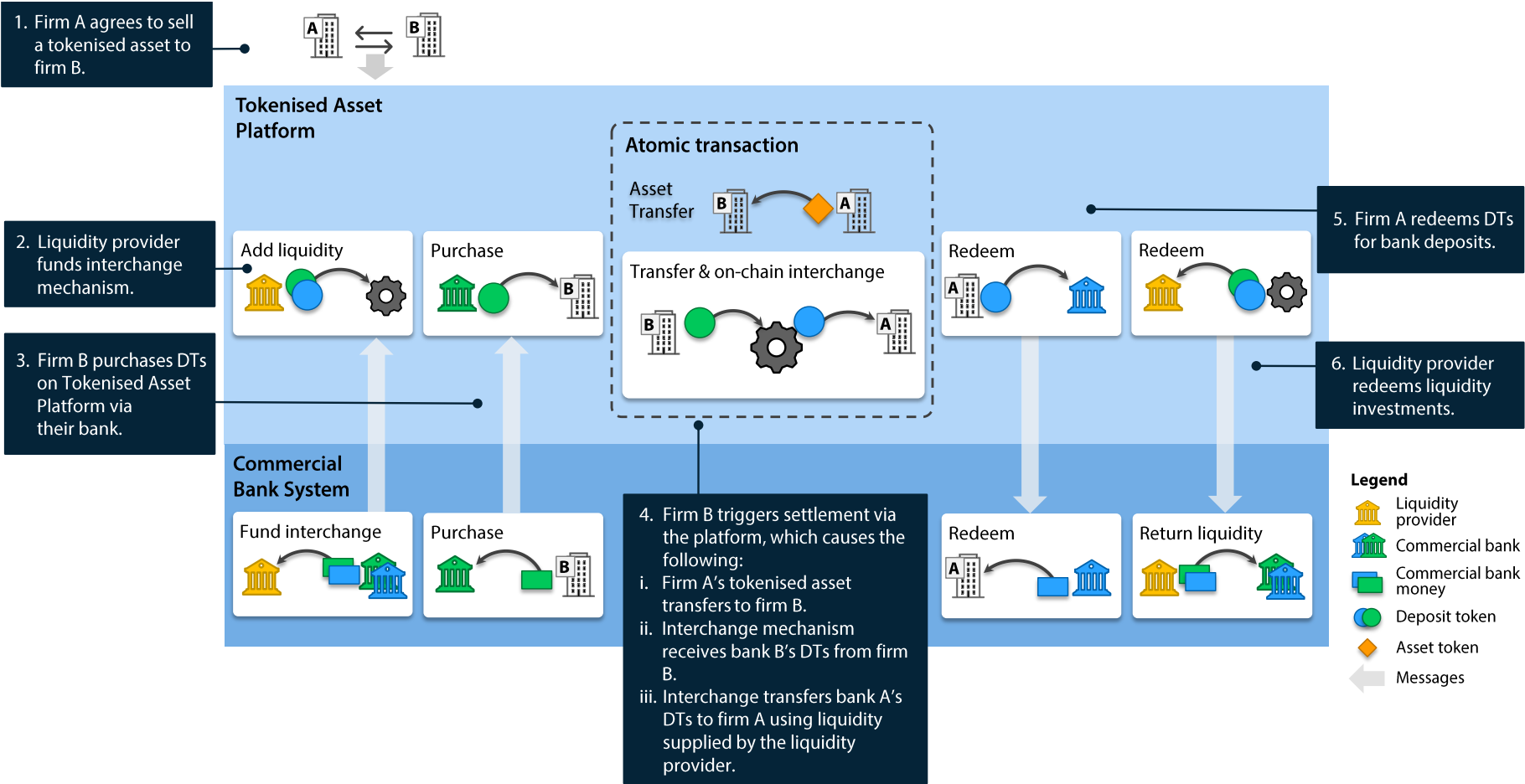
Model B: Wholesale CBDC on asset platform



Model C: Bank-facilitated DT interchange



Model D: Market-based DT interchange



Model E: 'Unified' ledger

