

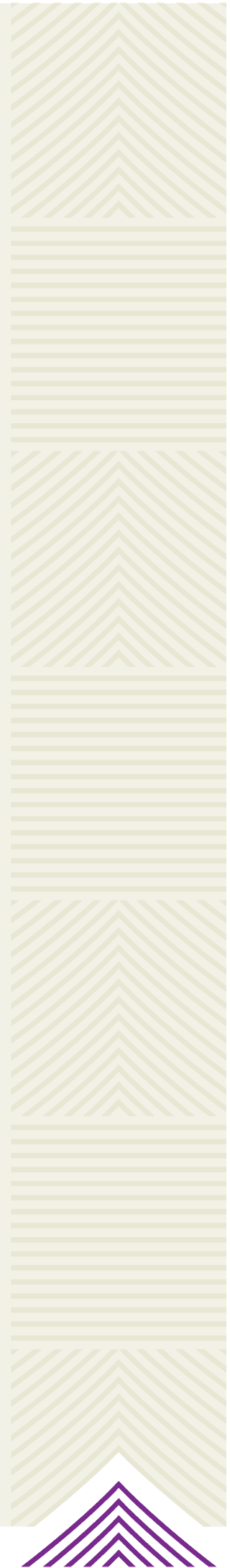


Reserve Bank
of New Zealand
Te Pūtea Matua

Innovation and reliability opportunities for digital cash

Digital Cash Consultation Note, #2

17 April 2024



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Contents

Abstract	3
1 Introduction	4
2 Defining efficiency, innovation, and reliability	4
3 Innovation and efficiency opportunities in New Zealand’s money and payments	5
3.1 Access to New Zealand’s payments landscape	6
3.2 Improved payments functionality and interoperability	10
4 Reliability opportunities in New Zealand’s money and payments	11
5 Digital cash innovation and reliability design requirements	12
5.1 Complementing measures to improve efficiency	16
6 Conclusion	17
References	18
Annex A: A multi-tiered digital cash ecosystem	20
Annex B: Insights from the technical workshops	22

Abstract

Digital cash could deliver more efficient, innovative, and reliable money and payments in New Zealand. Digital cash can provide a safe asset on a trusted platform that can be used by third parties in a way that is not subject to rent-seeking or anti-competitive motivations. Overall, this could be more competition, less barriers, and more services plugging the gaps and improving user experience. The safety of the digital cash as the underpinning asset, means that innovation can occur without increasing credit risk in money and payments. New functionalities embedded into the design of digital cash, like smart contracts and offline payments, would also support greater efficiency and reliability of payments.

1 Introduction

Digital cash has a unique opportunity to drive innovation in New Zealand's money and payments. Digital cash is itself a safe asset issued by the Reserve Bank of New Zealand (Reserve Bank). It would be transferred over a trusted platform that is operated by the Reserve Bank. The Reserve Bank has an opportunity to design the asset and platform with innovative technologies to enable new money and payments services for New Zealand. In addition, the platform would be open to the private sector to connect to and build other new digital cash services.

This note builds on the descriptions set out in the New Zealand payments landscape primer,¹ and discussions with industry to describe how digital cash as a new asset, payments platform and ecosystem could capture efficiency and reliability opportunities in New Zealand's money and payments. It explains the innovation and reliability opportunities set out in the [Digital cash in New Zealand Consultation Paper](#) published 17 April 2024. Overall, we find that the Reserve Bank is uniquely placed to drive efficiency, innovation and reliability in money and payments by supplying digital cash and a platform that allows private sector partnership. The design recommendations in this paper, clarify our 2021 digital cash principles of 'Innovative' and 'Reliable'.

Section two defines innovation, efficiency, and reliability. Section three shows the innovation and efficiency opportunities for New Zealand's payments landscape, section four describes the reliability opportunities. Section five lays out how digital cash can address these opportunities and explains how this informed our updated digital cash principles of 'Innovation' and 'Reliability'. Section six concludes.

2 Defining efficiency, innovation, and reliability

Innovation and efficiency are closely related terms. Productive and allocative efficiency refers to when all goods and factors of production in an economy are distributed or allocated to their most valuable uses and waste is eliminated or minimised. Dynamic efficiency refers to improving efficiency over time – this requires innovation. To be efficient, New Zealand's money and payments services must evolve and innovate over time. A report to the G20 describes payments efficiency as payments that are low cost and high speed, without compromising other relevant aspects such as ease of use, accessibility, availability, and safety.²

Efficiency in money and payments is related to the following economic concepts.

- Network effect: benefit of a certain good or service, such as a payments method or platform, increases as more people use it. Network effects are critical for any money and payment system to be successful.
- Natural monopolies and competition: the presence of network effects and/or high fixed costs may mean that a monopoly supplier is more efficient than a competitive market of suppliers. However, natural monopolies or concentration in an industry can result in inefficiency if they lock out competition at all levels in the industry (such as secondary service provision), or if they are generating excessive profits (beyond what is needed to operate).

¹ Dudson, et. al. (2022).

² BIS, IMF, Worldbank (2022).

- **Competition:** Lack of competition can result in prices being set too high, underproduction of goods, and less pressure to innovate. For example, the New Zealand Commerce Commission notes that “the process of rivalry between businesses means that excessive profits are limited in the long term, and businesses also tend to have incentives to innovate, invest, and act efficiently”.³
- **Externalities:** When the social costs or benefits have not been factored into the price and quantity supplied or demanded of a good or service an economic ‘externality’ arises. Central bank money has a positive externality as the benefits to society that it provides (such as supporting inclusion and choice) are greater than the benefits to an individual or single firm.

Reliability can be defined as ‘consistently good in quality and performance; able to be trusted.’ Resilience is a supporting condition for reliability and is defined as the ability to respond to or recover readily from a crisis, disruptive process, or some other form of difficulty. Safety is also a supporting condition of reliability and relates to the feelings of trust and security that end users have in storing their money in a particular form and using a particular system.

3 Innovation and efficiency opportunities in New Zealand’s money and payments

Like most economies, New Zealand has concentration in the number of private entities that issue electronic money and conduct payments. This enables a network where people have high certainty that their money will be widely accepted, and that the payment instrument they use to spend their money will also be accepted.

Overall, electronic payments work well, but there is room for greater innovation. The Reserve Bank underpins New Zealand’s monetary system by issuing central bank money. The private sector - commercial banks and non-bank deposit takers (NBDT) - also plays a critical role in our money and payment system by issuing funds into transaction accounts, issuing credit and debit cards, and facilitating account payments. Payment service providers also play a key role in facilitating transactions through their processing services.

However, access to New Zealand payments is highly reliant on access to transactional bank accounts. Transactional bank accounts are at the centre of banking relationships, and enable efficient, trusted, and predictable payments. They are the vehicle in which private money is issued, and through which many forms of payments are instructed.

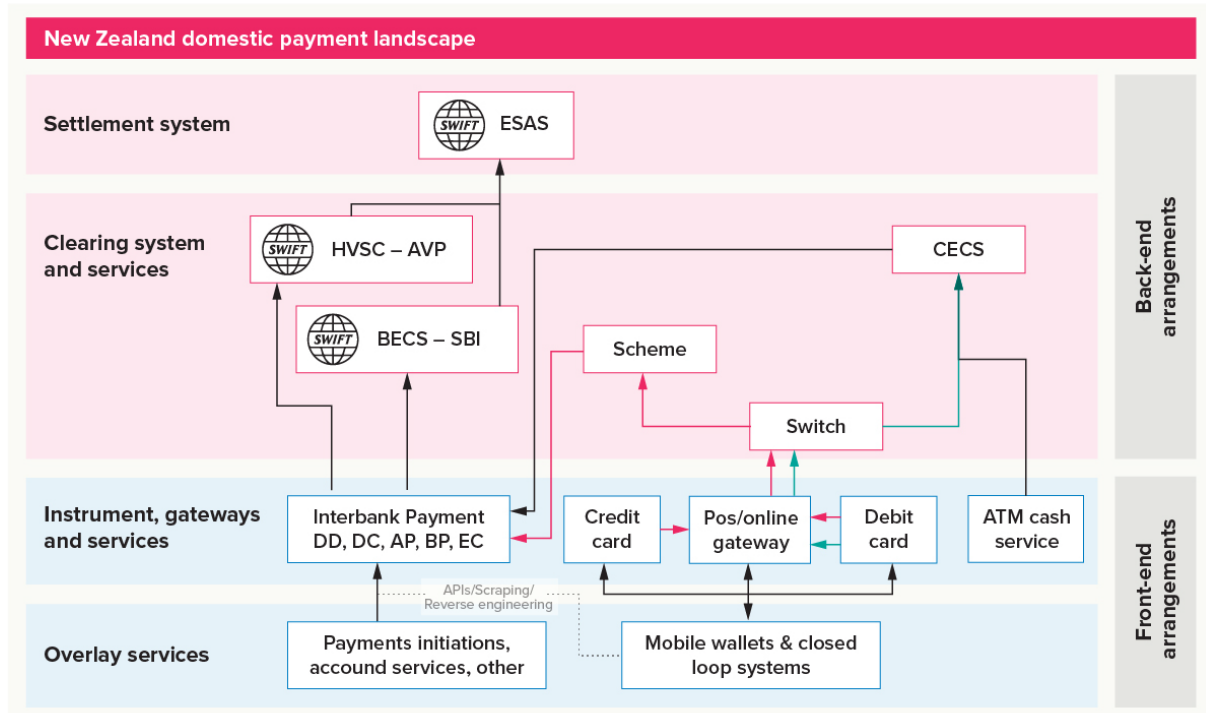
Figure 3 explains the current layout of the New Zealand payments landscape. Payments can be separated into front-end and back-end arrangements.

- **Front-end arrangements** are the products services systems, and gateways that end users interact with (highlighted in the blue area). The services allow us to start a payment, check our account balances, and access our money. Overlay services, exist at the very front end, and supply niche or specialised services. Overlay service providers can be small and may not be willing or able to offer full-service payments products to their customers, preferring to partner with other providers.

³ See Commerce Commission New Zealand (2023).

- The 'back-end' arrangements (highlighted in the pink area) refer to the systems and services that work behind the scenes to authorise (approve the payer has enough funds), clear (sending the payment information between banks) and settle (final exchange of funds) payments.⁴

Figure 3: New Zealand's domestic payments landscape



Source: Dudson et. al (2022). Note: DD = Direct debit, DC = Direct credit, AP = Automatic payment, BP = Bill payment, EC = All other electronic payments. Lines denote links between systems, services, or gateways. The teal lines refer to links between the EFTPOS systems and the pink lines describe links between the card scheme.

3.1 Access to New Zealand's payments landscape

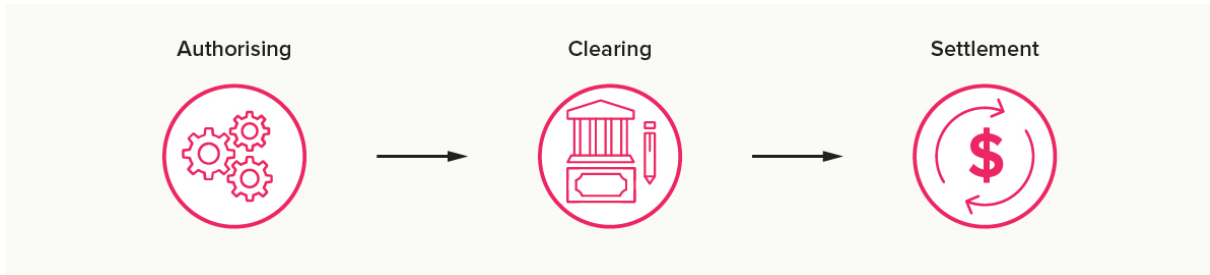
New entrants to the payments system face barriers to enter either the back- or the front-end of the payments landscape.

i Access barriers in the back-end

The back-end of the payments landscape consists of our settlement system (ESAS) and clearing systems (HVSC and BECS-SBI) as well as card scheme networks and switches. New entities can gain entry to this back end by becoming a direct participant in the systems or indirectly through services provided by a direct participant. Access to the back-end of the payments landscape, essentially means direct access to central bank money issued via ESAS.

⁴ For an explanation of the payment landscape see Dudson et al. (2022).

Figure 4: High-level schematic of the back end of the payment landscape



Source: Dudson et.al. (2022)

Some New Zealand registered banks are direct participants in ESAS. Other banks rely on services provided by ESAS participants (for a fee) alongside the other financial entities involved in the payments landscape. This is referred to as an agent-bank relationship. Other ESAS members include central banks and international organisations. No fintech is currently a member of ESAS. New Zealand does not have a licensing framework for fintechs, and depending on their business model, activities, and size, fintechs and payment service providers may not be regulated under the Financial Market Infrastructure (FMI) Act.

Entities apply to the Reserve Bank to be a direct participant of ESAS. Access is granted according to the ESAS access policy, which is currently under review.⁵

New Zealand's clearing systems HVCS, BECS-SBI and CECS are owned by a consortium of private banks and governed by an industry-body, Payments New Zealand (Payments NZ). Due to their systemic importance HVCS and SBI require members to also be a participant of ESAS. Consequently, non-banks or fintechs have expressed that it has been difficult for them to take part in New Zealand's clearing and settlement systems.

The governance of Payments NZ is not fully representative of the payments landscape. The composition of the board is static and does not reflect the evolving nature of the payments industry. Currently the eight founding shareholders are entitled to appoint directors (alongside the three independent directors), and each director has one vote. The Reserve Bank has encouraged Payments NZ to ensure its governance model better reflected the payments industry.

ii. Access barriers in the front-end

While the barriers to back-end systems are risk-based, the access barriers to the front-end arrangements stem from market powers and our aging core banking systems.

Interbank payments and cards are the most used payment instruments in New Zealand. Financial institutions (predominantly banks) sit behind both instruments as they issue electronic money into transaction accounts and facilitate interbank payments. Banks also issue scheme cards and are 'acquirers' of scheme card payments.⁶ This gives them considerable market power in retail payments. The following barriers and pain points have been experienced by third parties:

- i. Lack of access to customer data held in bank accounts including to instruct or authorise payments on behalf of customers
- ii. De-banking

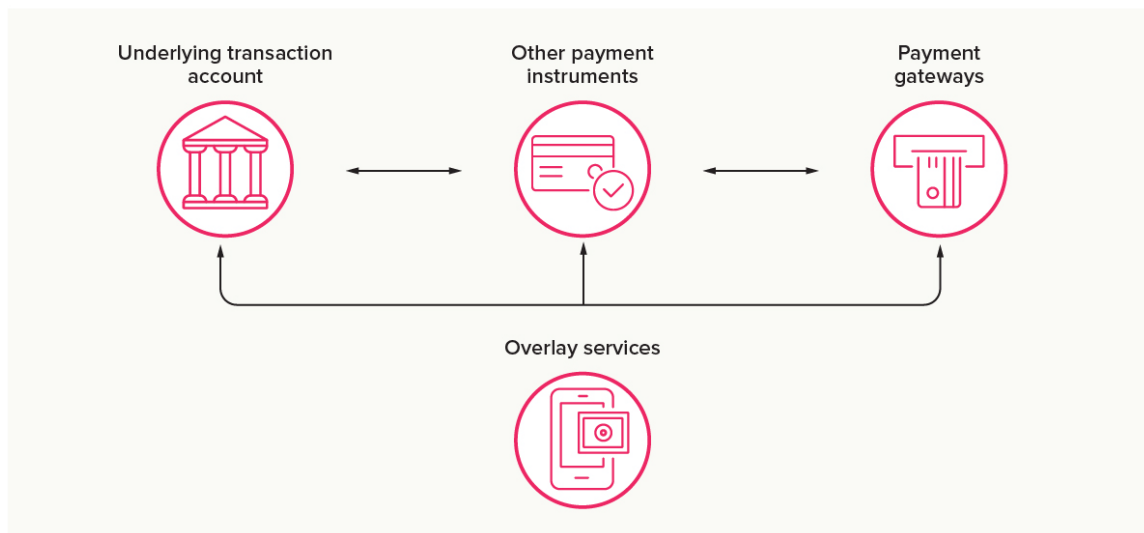
⁵ rbnz.govt.nz/have-your-say/2023/esas

⁶ Dudson et.al. (2022).

iii. High scheme card fees

Our engagements with industry and fintechs indicate these barriers make it difficult for third parties to provide new or overlay money and payment services.⁷ There are relatively few overlay services in New Zealand compared to other countries with more open payments landscapes. This may result in less innovation than is socially beneficial or desired.

Figure 5: High-level schematic of the front-end of the payments landscape



Source: Dudson et.al. (2022).

i. Access to customer data held in bank accounts

Financial institutions that issue transaction accounts and payment gateway providers hold valuable customer data. New payments service providers would like to access this data to offer new and convenient services. The safest method to access customer accounts is if third parties have a contractual agreement with the bank and the bank issues an API with sufficient functionality, this is referred to as 'open banking'.⁸

Despite industry progress on open banking, commercial banks do not have strong incentives to prioritise the work needed to provide third parties with access to customer accounts. Particularly if these third parties seek to compete with the bank's valuable competitive advantage in building products and services around the customer's account. Commercial banks also have aging core banking systems and may not be readily able to supply the API connectivity needed by a third party to offer a new innovative service.

This can result in delays for the third parties that want to launch services, as other activities are prioritised within the commercial bank. Canada's review of open banking found that using bilateral contracts instead of a framework of standard and common access rules, is "inefficient and do[es] not provide a consumer-centric and transparent foundation for open banking to thrive".⁹

⁷ See Annex B and FintechNZ (2022).

⁸ Open banking allows third parties to access customer data held at banks and initiate instructions using this data. It relies on API's. An API is a contract between two systems: it sets the terms and defines the communication between the systems; and enables one system to query or retrieve information from another system in a standard format, even though the systems have different software or different 'languages.' Watson (2016). APIs provide the interface between core banking systems and other systems.

⁹ Government of Canada.

Our workshop with FintechNZ members, held in September 2022, confirmed that it is difficult for new entrants to obtain reasonable contracts and sufficient API functionality with enough large banks (to reach enough customers) to make their service workable. In New Zealand, a new product would need connections with at least three large banks to achieve the minimum network effect needed. Developing bilateral relationships, contracts, and connectivity between up to three banks can be a time consuming, uncertain, and costly process. For example, one fintech cited a period of over 18 months to agree to a contract and set of APIs with one bank.¹⁰

Consequently, some new entrants do not gain traction while others pursue methods that are less safe to access customer accounts. These can be summarised as ‘permissioned data sharing’. This is where the customer gives a third party permission to access their accounts. This includes screen scraping and reverse engineering bank mobile apps. Both methods require customers to give their banking credentials to a third party at least once, or multiple, times. This act exposes customers to their credentials being lost or stolen. Further, collectors of customer data in this way are not regulated¹¹ and using these services violates the terms and conditions of internet banking.

Permissioned data sharing is also not efficient, services that rely on scraping or reverse engineering required constant monitoring in case changes to the banks’ web or mobile interface interrupt the service. Overlay service third parties make attestations that they treat the data carefully and there have not been any incidences of customer data violations.¹² But the risks to end users remain.

iii. De-banking

Many Fintechs find they cannot open a bank account due to risk appraisals from commercial banks. Anti-money laundering and countering financing of terrorism (AML/CFT) requirements place a regulatory burden on individual staff members. Banks are concerned about reputational impacts from AML/CFT non-compliance and pay close attention to the Office of Foreign Assets Control (OFAC) sanctions list. Once an entity is sanctioned it cannot be banked. The Australian-owned banks in New Zealand appear to have a lower risk appetite than other New Zealand banks particularly on crypto-assets (where they have a close to zero risk appetite) and fintechs.

There has been recent court action against the Reserve Bank by three money transmitters who are unable to obtain bank accounts in New Zealand. The money transmitters claimed that since the implementation of AML/CFT regulation in 2013 banks have consistently refused to open bank accounts to them and existing accounts have been closed. The High Court did not agree the fault lay with the Reserve Bank, and other case law supports banks’ rights to shut down a bank account (e.g. E-Trans vs Kiwibank).¹³ It’s possible that broader access to central bank money could support some of these business cases. For example, if access requirements are based on public policy objectives and free from commercial incentives.

vi. Scheme fees

Third parties can also ‘enter’ the payment landscape by building payments services that rely on card transactions or storing customer card details. However, this comes with a high price and increases the market power of card schemes (Visa, Mastercard, or UnionPay).

¹⁰ See Annex B for the findings from RBNZ FintechNZ workshop. See also FintechNZ (2022).

¹¹ MBIE (2022).

¹² Fintech NZ (2022).

¹³ E-trans international finance ltd v Kiwibank Ltd [2016] NZHC 1031.

Most electronic point of sale transactions are made using payment scheme cards, and these schemes charge the merchant a fee per transaction, and for some (typically smaller) merchants this can become a significant expense. International literature suggests that a profit-maximising fee set by a payments platform may result in an inefficient pricing structure where merchants are overtaxed and card usage by consumers is over subsidised by non-card users.¹⁴ The Retail Payment System Act 2022, administered by the Commerce Commission, sets a cap on the size of the interchange fee charged by the issuing bank to the acquiring bank.¹⁵ The Retail Payment System Act also provides broader authority to the Commerce Commission, for instance, to set scheme fees and access requirements.

Merchants that are not satisfied with their fees have the choice to refuse to accept credit cards or contactless payments. This reduces consumer choice. Alternatively, merchants can use surcharging, this carries a risk of inefficiency if the surcharge is higher than the underlying costs.

v. Merchant choice for payment arrangements

The overall efficiency of our money and payment system could also be improved if merchants had greater optionality for what services they use to accept electronic payments. Currently, there are three notable constraints on merchant choice.

The first is the ability to easily switch the payment gateway provider for online transactions. For example, some payment gateway providers that store customer card information may not agree to transfer the merchant's customers' data to a new service provider, making it difficult for merchants to switch providers.

The second is restricted ability to choose to route payment through the payment switch with the least costs (i.e. lowest cost routing).¹⁶ For example, when a debit card is presented contactless, the merchant cannot select for the payment to be routed as a switch-to-issuer card payment to avoid or reduce the scheme fee. Instead, scheme cards and Payments NZ set routing rules that merchants must follow.

A third constraint is the time it takes for merchants to shop around for the best deal on their payment's services. Merchants with less resourcing may opt to select the services provided by their main bank even if this it does not best meet their needs.

3.2 Improved payments functionality and interoperability

There is opportunity to improve the functionality of electronic payments in New Zealand and invest in a debit network that meets current and future needs.

First, New Zealand does not have a domestic real time (instant) electronic method for person-to-person (P2P) or point of sale (PoS) transactions. Users must either carry cash or wait until a bank transfer arrives in their transaction account. Many innovative products and services rely on, or perform better, if the payment can be completed in real time. In an efficiency sense, real-time payments would benefit the payees, without any cost to the payers of any given benefit.

¹⁴ Bedre-Defolie and Calvano (2013) and Edelman and Wright (2015).

¹⁵ to the lower of (a) 0.8 percent per transaction; (b) the interchange fees per transaction as at 1 April 2021, this cap came into force on 13 November 2022 Commerce Commission (2022).

¹⁶ Responses to MBIE Retail Payment Systems 2020 Issues Paper.

Payments NZ's payments modernisation project is consulting on building a new real time processing platform. The payments industry is yet to decide that the benefits of real time payments are sufficient to justify the expenditure needed to implement it. Payments modernisation would primarily address real-time clearing and is not currently proposing real-time settlement. ESAS is not designed to support line-by-line real-time settlement for a high volume of retail payments.

Second, government-to-person (G2P) payments could be improved, particularly one-off universal or time sensitive payments, if we had real-time settlement and direct access to retail accounts. For example, minutes from Select Committee discussions reveal that IRD noted the 'Taxation (Cost of Living Payments) Act' would be difficult to administer.¹⁷ Universal and real time G2P payments are desirable for allowing government response to emergencies. For example, if the New Zealand government wanted to respond to a natural disaster that occurred on a weekend with a relief payment, the recipients would not be able to receive the relief payment until the next business day (or later if IRD did not have their bank account details).

Third, there is no offline electronic payment functionality for most services. This requires users to have access to the internet or data to use electronic payment methods, which worsens financial exclusion by making it also digital exclusion.¹⁸

Finally, the investment in and use of EFTPOS has declined over recent years. EFTPOS was introduced to New Zealand in the 1990s and became the dominant form of payment by 1997. It was initially successful and highly innovative. EFTPOS is also low cost for consumers and merchants. Issuing banks do not earn interchange revenue from EFTPOS cards and customers do not earn rewards for using it. Over time, the use of EFTPOS has declined as there has been a lack of incentive for banks to promote EFTPOS cards to their customers, or for customers to use it. The EFTPOS network and cards have been underinvested in, resulting in outdated security and reduced functionality including an inability to be used for online payments.

4 Reliability opportunities in New Zealand's money and payments

A key part of the reliability of money is credit risk. For this reason, the CPMI-IOSCO principles for financial market infrastructure recommend that a systemically important FMI should conduct its money settlements in central bank money where practical (principle 9).¹⁹

Money issued by the private sector – such as a bank, a non-bank deposit taker or a cryptoasset provider – carries a risk that if something happens to the funds the end user may struggle to get their money back. Banks and non-bank deposit takers are regulated by the Reserve Bank, in part to manage that risk. Cryptoassets and stablecoins are not subject to any regulation, however, and may be preferred by users due to certain innovative use cases and compatibility with blockchain technologies. There is an opportunity to develop safer assets that can also provide innovative uses and be compatible with blockchain technology.

¹⁷ New Zealand Parliament (2022).

¹⁸ See [Inclusion opportunities for Digital Cash - Digital Cash Consultation Note](#).

¹⁹ Committee on Payment and Settlement System et al. (2012).

Further, the structure of New Zealand's payment landscape (outlined in section 3) has several single points of failure:

- One settlement system that settles in central bank money – ESAS, which has critical path dependency on one of three clearing systems (which facilitate different types of payments).
- Two card schemes that dominate scheme card payments.
- One switch that services most card payments.
- One payment gateway that dominates online gateway services.

If there is a failure in one of these systems, some users may struggle to make their payments, so an alternative platform or system can improve individual payment reliability.

The payment landscape is also vulnerable to certain internet or paper outages such as those caused by natural disasters. In these cases, offline payment methods such as physical cash provide people with a personal back-up payment method.

5 Digital cash innovation and reliability design requirements

Digital cash will require the establishment of a new ecosystem. A digital cash ecosystem is an environment of systems, services, roles, providers, and arrangements supporting the end-to-end lifecycle and all use cases. The building blocks of a digital cash ecosystem are set out in the [Designing a digital cash ecosystem – Digital Cash Consultation Note](#) as:

- **Asset:** a NZ dollar with a 1:1 exchange rate with cash. Has a direct legal claim on the Reserve Bank.
- **Platform:** Core technology layer enabling the issuance and transfer of the asset.
- **Market:** The environment of systems, services, roles, providers, and arrangements supporting intermediaries and third parties.
- **User:** The end person or entity storing, spending, or receiving digital cash.

Digital cash can directly increase access to the payments landscape and introduce new functionality to support broader innovation.

Digital cash can directly increase access to the payments landscape

A digital cash platform could directly alleviate access pain points by ensuring that the asset and platform are open and accessible to third parties and interoperable with existing payments structures. By increasing access to central bank money, we can boost payments competition, and reorient some market power away from incumbents who have been slow to invest in substantive improvements to payments functionalities.²⁰

²⁰ For example, Payments NZ acknowledged the demand for real time retail payments as far back as 2015 but issued its first report investigating the need for real-time payments in 2022. Payments NZ (2015; 2022). International literature suggests that the market power of electronic payments networks can explain slow adoption of electronic payment products (less investment in R&D) Li et. al (2020).

An open platform would support an ecosystem that is made up of many players beyond the Reserve Bank. For example, fintechs and banks might supply customer on boarding and wallet services. To encourage a diverse ecosystem, and be a meaningful choice for merchants, digital cash must be highly interoperable. This means designing a digital cash platform that supports seamless vertical integration with upstream and downstream services in the payments process, as well as interoperability with competing services outside of the digital cash ecosystem (horizontal interoperability). Digital cash can support greater interoperability by providing third parties with an alternative platform to connect to the payments landscape that is not dependent on the bank account structure. The challenges to interoperability must be addressed, these include technical, commercial, and legal constraints.²¹

The extent to which digital cash platform services can be 'cheaper' than card schemes is yet to be decided and will depend on design details. There will be a cost to running the platform and how that is funded needs to be carefully considered to ensure there is a commercial model that incentivises third parties to take part and invest. What is clear is that the pricing structure should not support excessive profits and should generate revenue to ensure future investment.

A digital cash platform could use tiered access requirements based on the roles third parties could have. For example, some service providers may supply niche aspects of the payments process such as the consumer interface, while others may focus on core processing activities. Certain types of participants may not need as much capital or depth and breadth of risks management policies that would be expected of an ESAS member.

External stakeholders have noted the potential efficiency loss if New Zealand's payments landscape was to support a digital cash as well as existing infrastructure as more resources might be used to provide payments. This cost must be weighed against the potential benefits of digital cash.

Introduce new functionality

Digital cash can be more responsive to consumer demands. Through the design of digital cash, the Reserve Bank can respond to current unmet needs like real time point of sale and person to person electronic payments. It could improve the current debit payment offering in New Zealand by enabling real time settlement of retail payments and offline functionality while keeping security and operational performance. The platform used to deliver digital cash can also incorporate new innovations in digital money such as programmable payments using smart contracts.

Digital cash can also be used to address known payment pain points. This could include making some G2P payments easier or adding a new contactless payment method for public transport.²²

²¹ Boar et. al (2021).

²² New Zealand Government (2022).

Box B: Smart contracts

Smart contracts are contracts that are coded around the string of bits that represents money, so that if certain actions are triggered the funds can be 'automatically' paid to an intended recipient. These can also be referred to as conditional payments, or "if this, then that" actions with a trigger and a resulting action.²³

Smart contracts give the end user the ability to develop customised contracts, or transaction pathways. Conventional contracts can also be used to trigger actions but typically must be arranged and facilitated formally through designated third parties such as payment operators, or lawyers. For example, when buying a house, the buyer deposits the funds with a lawyer who ensures that the funds are transferred to the seller at the same time the house title is transferred to the buyer. A smart contract on token-based money can in theory ensure that the funds are released to the seller at the same time the house title is transferred to the buyer.

Smart contracts could increase efficiency by automating a range of manual processes reducing risk of manual errors. However, smart contracts do not remove all risks, for example, it may still be advisable to ensure that smart contracts are properly effecting a legal contract. It is not clear to the extent that they will replace the need for existing intermediaries, but they may be useful for intermediaries to provide a wider range of more customisable services.

Supporting broader digital innovation

A digital cash platform that is open to third parties would put competitive pressure on banks and card scheme fees. By encouraging a diverse ecosystem with central bank money at its core, digital cash may also support opportunities for broader innovations. These include identity management and enabling data use in new ways. For example, one of the prominent areas identified through our external engagements so far has been digital identity. Stakeholders noted an opportunity to provide solutions to manage identity using cryptography solutions such as 'zero-knowledge proofs' that allow identity to be proven to other parties without personal information being shared.

Some Fintech technical workshop contributors suggest that digital cash could also support innovation in other services, such as:

- Advanced balance and transaction insights, i.e. for wealth management, insurance approvals, loan serviceability assessments, and meeting savings goals.
- Digital interface to other products and an open-source user experience infrastructure.
- Exchange services.
- Integrations, accounting, and reconciliations.
- On boarding i.e. interface and customer service.
- Open econometrics (as-a-service).

²³ Elsdon et. al (2019).

- Payroll and financial management services.
- Security, auditing, and tracing.

Safe and reliable money

The Reserve Bank has a comparative advantage in providing a safe, stable, and trusted form of money and providing a secure, reliable critical national infrastructure. We already issue banknotes and coins and operate the ESAS that settles all interbank transactions.

The underlying credit risk of digital cash would be close to zero. In the same way that people trust physical cash to always be redeemable, digital cash would always be redeemable. Third parties, such as payment service providers or overlay service providers, can choose to use digital cash to enable their services rather than using a cryptoasset or issuing their own currency.

Greater system resilience

Digital cash can improve the resilience of payments by providing access to an alternative payments platform that conducts clearing and settlement activities and allowing new entrants into payment service provision. Digital cash that enables real time settlement of each payment also reduces settlement risk.

Digital cash can also improve the reliability of payments by providing users with an alternative electronic payment option if other electronic payment methods are not available. For example, if merchants do not accept credit cards, if one of the card schemes has an outage, or if ESAS has an outage, or if there is a cyberattack on a particular aspect of the payment landscape.

Digital cash principles

The innovation, efficiency and reliability opportunity of digital cash have been summarised in our updated digital cash principles of 'Innovative' and 'Reliable'. The full suite of digital cash principles is in the [Digital cash in New Zealand Consultation Paper](#).

Table 5: Digital cash principles

Principle	Supporting criteria
<p>Innovative</p> <p>Digital cash will be innovative and support new and improved ways to make payments.</p> <p>To achieve this, digital cash must be efficient and feasible.</p>	<p>Efficient</p> <p>The digital cash ecosystem uses the least resources possible and makes sure to allocate resources towards user requirements. This requires more competition and high interoperability with the existing payments landscape.</p> <ul style="list-style-type: none"> • Competition: Digital cash enables broad access to, and participation in, New Zealand's money and payments landscape. Businesses compete to win and retain users of digital cash. • Interoperability: Digital cash is compatible with different payment devices and systems in New Zealand. <p>Feasible</p> <p>Digital cash and its ecosystem of services can be delivered in New Zealand. Service providers are incentivised to be involved in the</p>

Principle	Supporting criteria
	<p>ecosystem. This requires digital cash to be simple and have balanced incentives.</p> <ul style="list-style-type: none"> • Simple: Digital cash should be simple to design, develop and implement. • Balanced incentives: Service providers — banks, payment companies, and new providers — will deliver digital cash services in a sustainable and efficient way.
<p>Reliable</p> <p>Digital cash will be reliable – so you can trust that your money remains safe, and payments can be made when you want to.</p> <p>To achieve this, digital cash to be resilient and safe.</p>	<p>Resilient</p> <p>Digital cash can recover quickly if it's exposed to risks or outages.</p> <p>Safe</p> <p>Digital cash is protected from things like failures and cyber-attacks, so you feel safe using it. This requires the payment to be final and compliant.</p> <ul style="list-style-type: none"> • Final: Once you make a payment, it can't be reversed or reclaimed. • Compliant: Digital cash will need to comply with all relevant legislation and regulations.

5.1 Complementing measures to improve efficiency

Digital cash would complement existing measures to improve efficiency. These include open banking, the ESAS access review, Payments NZ's payments modernisation, digital identification, and consumer data rights.

Open banking in New Zealand is being led and developed by the industry.²⁴ The API Centre has developed API standards and powers to impose implementation mandates, assess compliance breaches and escalate consequences. These powers are based on the consent of members. The API Centre is also developing a refreshed bilateral agreement template, third party security requirement assessments, and a centralised due diligence services to support more efficient partnering between banks and third parties. The industry is yet to fully implement the API standards.²⁵

The Reserve Bank is currently undertaking a review of the ESAS access policy, to promote the efficiency of the payments system by supporting competition and innovation, by being open to new entrants while managing the risks to the system and the Reserve Bank. ESAS is our core real time gross settlement system that underpins all interbank transactions in New Zealand, it is also the channel through which monetary policy is implemented.²⁶ Digital cash may be better placed to provide more open access than existing payments systems due to its expected lower systemic importance and focus on retail uses. We expect the digital cash platform to process high volume, low value transactions on a real time basis.

Digital identification (or digital identity) is defined by the NZ Digital Identity programme as a digital representation of your identity information, and other attributes about you, that you can use to

²⁴ Previous government Ministers have expressed concern at the lack of pace in implementing open banking. See the December 2019 letter to API Providers by then Minister Faafoi, Faafoi (2019).

²⁵ Payments NZ (2023).

²⁶ In 2020 HVCS processed \$5.42 trillion and SBI processed \$1.44 trillion. ²⁶ In 2021, ESAS processed \$33.5 billion.

prove who you are online to access services digitally. The Reserve Bank envisages various forms of digital identification being used across a range of digital cash services, including opening a new account and authorising payments.

Payments NZ is working on next generation real-time payments capabilities. The Reserve Bank encourages progress on real time account-to-account payments and does not see any critical dependency between digital cash and a real time account-to-account payment system. However, digital cash could have better features if it is highly interoperable with real time account-to-account payments. While real time payments and digital cash may compete in some use case scenarios, there are potential opportunities for design synergies.²⁷

Finally, in 2023 the Government decided to establish a consumer data right in New Zealand and MBIE consulted on the Customer and Product Data Bill. If enacted, this Bill would enable consumers to ask banks and other holders of their data to share this data with third parties. It has the potential to increase access to the payments landscape for third party service providers.²⁸

6 Conclusion

New Zealand has a concentrated and efficient payment system based around transaction bank accounts, but efficiency could be improved by more competition and innovation. Digital cash can provide an open and interoperable platform that boosts competition in both the back end and front-end of the payments landscape. In doing so, it will also enable more private sector innovation, including by incentivising incumbents to innovate.

Digital cash can also improve the reliability and innovation of 'money' by being a low credit risk asset with direct legal claim on the central bank as well as providing a secure transfer platform. Fintechs, who often struggle to get bank accounts, can use the asset and platform to build their innovative services, this is less risky than if these fintechs were issuing their own asset on their own platform (i.e. stablecoins on a distributed ledger).

Finally, digital cash can also improve the resilience of the payments system by providing an alternative payments platform which can be a back-up in case of an outage on the current system.

There are a range of existing initiatives underway to address pain points in New Zealand payments, including regulation of wholesale and retail payments systems, a consumer data right and industry efforts towards real-time clearing and open banking. Digital cash is compatible with these developments.

²⁷ See the Reserve Bank's letter to Payments NZ on 10 July 2023, Silk (2023).

²⁸ In 2021, the government confirmed it will implement CDR and the then Minister of Commerce and Consumer Affairs signalled that the banking industry will be the first application of this bill, although implementation will be at least two years away. See New Zealand Government (2021).

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Annex A: A multi-tiered digital cash ecosystem

To build up a picture of what level of 'tiering' we might have in a New Zealand digital cash ecosystem, we can consider the various functions in the ecosystem, and what existing or new entities might provide those services. We can then assess against what functions the Reserve Bank must provide, and what functions can be provided by third parties. This analysis is captured in Table A.1 with examples of which providers might provide certain types of functions. More work is required on the governance and access criteria for a digital cash ecosystem.

Table A.1: Potential range of services and service providers in digital cash ecosystem

		Reserve Bank	New oversight structure	New infrastructure providers	New PSPs	Existing PSPs	New customer services	Financial institutions	Independent ATMs	Merchants
Govern	Establishing policies (Govern ecosystem and its parts)	✓	✓							
	Oversight and monitoring	✓	✓							
	Delegated authority (To act on behalf of governing body for certain decisions)		✓	✓				✓		
	Approve new members/service providers to ecosystem*	✓	✓	✓						
Issue	Issue digital cash** (Create/redeem digital cash)	✓			✗	✗	✗	✗	✗	✗
	Distribute digital cash to users			✓		✓	✓	✓	✓	✓
Transfer	Payment initiation	✗	✓	✓	✓	✓	✓	✓		✓
	Check transactions can be fulfilled		✓	✓	✓	✓	✓	✓		
	Validate/clear & settle transactions***	✓		✓		✓		✓		
	Develop and maintain transfer system software (open or closed source, sets transfer rules)			✓		✓		✓		
	Security maintenance			✓		✓		✓		
Front-end	Customer on boarding (including KYC)	✗					✓	✓		
	Account services	✗				✓	✓	✓	✓	✓
	Cash integration				✓	✓	✓	✓	✓	✓
	Customer protection and support services						✓	✓	✓	✓

*Excluding customers **Issuance may take different forms depending on the model adopted ***Clearing may or may not include netting. **** 'New' providers demonstrate possibilities rather than decisions. ✓ = in-scope for the central bank, ✓ = possible provider, blank = undecided, ✗ = not in scope

Annex B: Insights from the technical workshops

In 2022, the Reserve Bank held several 'technical workshops' on the innovation and interoperability aspect of a central bank digital currency (CBDC). These workshops were held before the Reserve Bank had developed the high-level design direction provided in the Consultation Paper and we had deliberately used the more generic term 'CBDC'. The three industry groups were: Commercial banks, Fintechs, and Payment Service Providers (PSPs). The workshops presented high-level material on the public policy objectives and outcomes for a CBDC and facilitated a whiteboard brainstorm exercise on areas relating to pain points and opportunities in the system, opportunities for a CBDC, and whether these organisations see a role for themselves in a CBDC ecosystem or using the CBDC. The findings of these workshops are summarised below.

CBDC opportunities:

- Commercial banks felt more work is needed to understand whether a CBDC is the right tool to address payments system pain points (compared to other options) and requested further details on the link between open access, innovation and the trade-offs that might ensue.
- Fintechs and PSPs felt that a CBDC can support improvements in payments functionality by the features and functionalities embedded in a CBDC itself (i.e. on data capture and functionality). This may in turn support innovation in other payments services that might use a CBDC, and support innovation in other services more generally.
- Fintechs also noted that a CBDC can improve confidence, safety, and trust around innovation in money and payments. It can provide end user benefits in the form of better identity management, trusted asset, safety, and inclusion.
- PSPs noted that a CBDC could provide an additional settlement platform for fintechs to use, support greater payment functionality, and bring New Zealand back to being an innovative world leading digital payments nation. They commented that many technologies are being underutilised by the current market players but could be used to support innovative outcomes.

Willingness to partner with CBDC/be involved in the ecosystem:

- Commercial banks noted investment in a new product such as CBDC would be commercially driven, although agreed they would likely be involved in a CBDC if it was issued. Emphasis was put on the value proposition.
- Fintechs noted a CBDC could support them by providing a level playing field, being open and allowing access to customer data, which in turn allows improved services in NZ. Fintechs expressed they were open to playing a role in providing improved payments using CBDC.
- PSPs felt they were uniquely placed to support the distribution and acceptance of a CBDC. They considered the point-of-sale merchant acceptance network as being well positioned to easily support purchases with CBDC. PSPs expressed they were open to playing a role in providing improved payments using CBDC.

Support needed:

- Commercial banks requested a practical understanding of how the ecosystem parts fit together, as well as what would drive adoption rates and whether a CBDC would be materially better than current offerings.

- Fintechs requested support in areas such as clear governance rules and standards and digital identity management, including clarity around AML/CFT obligations for a CBDC.
- PSPs saw themselves as playing a key enabling role for the CBDC ecosystem. They felt it would be important to ensure the right balance of investment incentives were in place, while retaining efficiency and low costs. They also noted that it would be critical for a CBDC to interoperate with existing technologies and arrangements including at the point of sale.

Digital Identity:

- All groups independently raised that digital identity, and identity management was a key design area to be addressed (that was not present in the CBDC ecosystem outlined at the workshops).