Reserve Bank of New Zealand
Te Pūtea Matua

# Digital cash in New Zealand

## Consultation Paper

17 April 2024

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# Executive Summary

At the Reserve Bank of New Zealand Te Pūtea Matua (Reserve Bank), we're looking at digital cash. It would be an electronic version of physical cash, issued by the Reserve Bank, but it would not replace physical cash. We are actively working to protect the role of physical cash in New Zealand.

## The way New Zealanders pay for things is changing

We know that being able to use cash is still important for many New Zealanders. But we also know that the way people pay is changing, and our economy is becoming more digital. Digital payments can make it easier and quicker to buy the things we want. To keep up with the changing times, we are looking at the possibility of issuing digital cash.

## Digital cash is in addition to physical cash

Digital cash would be issued by the Reserve Bank. It would give New Zealanders the choice of using digital cash or using your regular bank accounts, cards, cash or however you make your payments.

Digital cash isn't a new concept. Every day, billions of New Zealand dollars issued and backed by the Reserve Bank, already flows behind the scenes between commercial banks and other big institutions. This happens digitally on a super-resilient electronic platform we provide called the Exchange Settlement Account System.

## Digital cash would give you more choice when making payments

It would mean everyone has access to central bank money – either as physical cash or in digital form. Now, physical cash in banknotes and coins is the only type of central bank money available to everyone to pay for things.

We want the certainty and safety of using digital cash to be available to all New Zealanders and businesses alongside physical cash. Digital cash design should also carefully meet or balance different considerations if it's to work for everyone.

## Digital cash would be easy to access and use, and private

We want everyone to have access to digital cash, even if they don't have a bank account. Like banknotes, you could use digital cash when the power is out, or the internet is down. If you want, you'll be able to use a physical card to access your digital cash and on devices like your phone or watch.

You could use digital cash to buy things in shops, online, or send money to friends and family instantly. Like banknotes and coins, digital cash would work with current payment options, and you can switch between the two.

It will also be private. The Reserve Bank will not be able to see or control how you spend your money.

## Digital cash would support innovation

New technologies and new forms of electronic money are always emerging. These include:

- stablecoins
- cryptoassets (like Bitcoin or Ethereum)

- decentralised finance.

Digital cash can take advantage of new innovative features like smart contracts. These allow you to automate a payment or do things like keeping totals of expenses. This gives you greater control over your money.

Digital cash could also boost competition in New Zealand's payments landscape by supporting new types of money and payments services from the private sector. New Zealanders will have the choice of who they use to access their digital cash services.

### Trust in our money is essential

We, the Reserve Bank, would issue digital cash just like we issue banknotes and coins today, so you can trust that it'll be safe and secure. Other forms of digital money are issued by the private sector – they can involve risks, particularly if something goes wrong in New Zealand's financial system.

Some other forms of digital money, like cryptoassets, are not denominated in New Zealand dollars. If a lot of people use them, it can pose a risk to our economy, the New Zealand dollar, and our monetary sovereignty. Monetary sovereignty is important because it means that New Zealand can independently manage its money, set interest rates, and make decisions without being overly influenced by external forces.

Digital cash will be government backed and denominated in New Zealand dollars. Digital cash will help us keep our monetary sovereignty so you can continue to have confidence in our monetary system.

### We're not the only central bank looking at digital cash

Many other central banks around the world are exploring digital cash to support:

- monetary and financial stability
- social and financial inclusion
- competition and private companies to develop innovative ways for people to pay.

### We want you to tell us what you think about digital cash

We have developed some principles and design options for New Zealand's digital cash, and we want you to tell us if we have got it right and what it would mean for you.

There are many details to work out before we can decide if digital cash is right for New Zealand, and we plan to consult again in the future on whether we should go ahead and issue digital cash.

You can give your feedback by taking our online survey or making a written submission. The consultation is open until 26 July 2024. Visit rbnz.govt.nz/digitalcash to find out how to have your say.

# 1 Introduction

The Reserve Bank of New Zealand Te Pūtea Matua (Reserve Bank) is investigating a digital form of cash. Digital cash is a type of central bank digital currency. Just like physical cash, it would be issued by the Reserve Bank and be trusted and safe. It would also protect people's privacy, and anyone could use it without needing a bank account.

Our work on digital cash is a multi-year and multi-stage process. We have not decided to issue digital cash. We first consulted on digital cash in 2021. We published the Future of Money – Central Bank Digital Currency Issues Paper (2021 Issues Paper) and received a wide range of views. We are now sharing our latest thinking on what digital cash could look like in New Zealand. We describe what we mean by digital cash and how New Zealanders could use it. We also describe why the Reserve Bank is investigating it, and what it would bring to New Zealand.[1]

We want your feedback on our judgments and design options for digital cash. This will inform our future work on whether digital cash is right for New Zealand.

Digital cash will not replace physical cash.

# 2 What is digital cash?

- **Digital cash would be a new form of cash issued by the Reserve Bank to the New Zealand public.**
- **Digital cash would be:**
  - **denominated in New Zealand dollars (NZDs). It could be swapped 1:1 with physical cash, and other forms of NZD, like money in your bank account.**
  - **private, secure, and able to be trusted – the Reserve Bank will not control how you spend your money.**
  - **available to everyone and distributed by the private sector – but you would not need a bank account to use it.**
- **Our focus in this consultation is the use of digital cash by individuals. You could use it to do new things like make an instant digital payment to anybody. You could also make payments without connecting to internet.**

Central bank money currently comes in two forms: Physical cash in banknotes and coins, and reserves. Cash is available to everyone, but only certain financial institutions can hold reserves at the Reserve Bank. Central bank money is a claim on the Reserve Bank, and ultimately on New Zealand's government. Digital cash would be a new form of central bank money and can be thought of as moving cash online.

Private money is issued by banks, non-bank deposit takers and other businesses. It always takes digital form. Banks and non-bank deposit takers are regulated in New Zealand, but other issuers like cryptoassets are not. Private money represents a claim against the entity that issued it. These entities have different credit and liquidity risks. Central bank money is safer than private money because the Reserve Bank has the lowest credit risk and liquidity risk.

## 2.1 Features of digital cash

Digital cash would have a range of features. Some are like cash, and some are new. This section provides a high-level overview of these features and section 6 expands on the details.

1 See the supporting Digital Cash Consultation Notes and background reports here.

## Issued by the Reserve Bank

Digital cash would be issued by the Reserve Bank, just like physical cash. It would be denominated in New Zealand dollars (NZD) and exchanged 1:1 with other forms of NZD such as cash and bank deposits. Just as with notes and coins, digital cash would represent a direct liability on the Reserve Bank. This makes it safer than private money.

## Distributed by the private sector

The Reserve Bank would not provide digital cash services directly to users. Just as the Reserve Bank does not provide cash directly to people today. Instead, there would be many digital cash service providers offering digital cash services. You would be able to choose which provider you use. You could also change providers or use several providers depending on the services you want. These may include banks, payments companies and new providers.

There would be a range of devices that people can use to access and make digital cash payments. The Reserve Bank would own and operate a digital cash payments platform. This platform would facilitate all digital cash payments.

Digital cash service providers would not be able to touch your digital cash. That means, even if a service provider failed, you would not lose your digital cash.

## Innovative and inclusive payments

Digital cash would be widely available to the New Zealand public. It would be used for payments made to and from individuals. New Zealanders could use digital cash to make payments to other people, businesses, or government agencies. Government agencies and businesses would also be able to make digital cash payments to people.

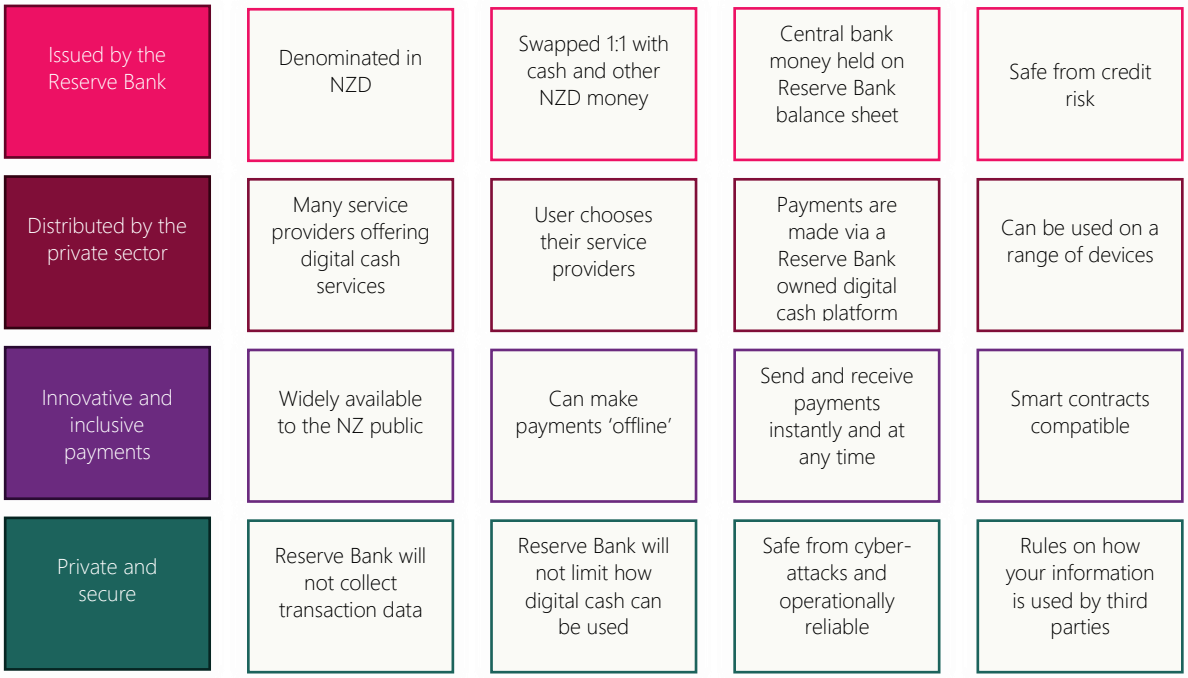
Digital cash will give users key features of physical cash. Specifically, digital cash payments would be available 24/7, and would be sent and received instantly. People would also be able to use digital cash to make payments even when they do not have access to the internet. To do this they could download their funds to a local device and use Bluetooth technology to make a transfer to another device.

There is also the possibility that digital cash can support wholesale uses such as cross-border payments.

## Private and secure

Digital cash will be private and secure. People would be free to use and spend their digital cash as they want to. The Reserve Bank would not be able to (nor want to) place any limitations on how the digital cash can be used. The Reserve Bank will set rules on how third parties can collect, use, share and delete your information.

***Figure 1: Digital cash design features***




## How would digital cash be used?

We can use the stories of Grace, Levi, and Maya to look ahead and imagine some of the ways people could open a digital cash account and use it in their everyday lives.

### Grace has just opened a digital cash account with her bank.

i. Opening an account is quick and easy – Grace uses her phone to take a photo of herself, which she uploads to verify her identity.

ii. Her identity is verified in a few minutes, and she now has a digital cash account.

iii. This account is separate from her other bank accounts. Her bank cannot touch the digital cash in her account.

iv. Grace uses internet banking to transfer money into her new digital cash account.

v. She also gives her employer her new digital cash account number, so she can get paid in digital cash.

vi. Later, Grace finds some cash in her wallet. She goes to a smart ATM and deposits cash directly into her new digital cash account.

vii. Grace can choose to access her digital cash through her phone, online banking, her watch, or through a separate physical card.

viii. In the future, there would be many digital cash service providers offering digital cash services. You would be able to choose which provider you use, and this could change depending on the service you want.

ix. Like Grace, you could open a digital cash account with your own bank or use a private payments company.

**Levi wants to use his digital cash to pay for things instantly.**

i. Levi orders a coffee at his local café, he chooses to make the payment by holding his phone, wearable or card against the point-of-sale terminal. He also orders one for his friend Grace.

ii. Levi also wants to book flights to Marlborough to visit his Nan. By paying with digital cash, Levi won't get charged any extra fees.

iii. Levi also wants to be able to receive digital cash payments anywhere, anytime. By tapping their phones together, Grace can pay Levi back for the coffee he bought her earlier this morning. Grace's money is sent to Levi instantly and securely.

iv. Levi is also going to take his digital cash card on holiday, in case he needs to buy something and has no data left on his mobile to make an online payment.

**Maya has more control over how she manages her money**

i. Like most of us, Maya wants to have more control over how she manages her money.

ii. Using her digital cash banking app, Maya can see exactly where she is spending her money.

iii. Maya wants to cut down on the number of coffees she buys so she can save for a new car.

iv. The app adds up how much Maya has spent buying coffees in a month and lets her compare how this has changed over time.

v. This helps Maya manage her spending without having to spend time adding her expenses manually.

vi. Maya also uses her digital cash app to set up an automatic payment to transfer the digital cash she has left over every month into her savings account so she can earn interest. This helps Maya achieve her goal of buying a new car faster.

vii. Maya also uses automatic payments to transfer some of her digital cash into her expenses account. This helps Maya track her bill payments and allows her to use the automatic payments that she has already set up.

# 3 Why is the Reserve Bank investigating digital cash?

- **Central bank money, in the form of cash and reserves, plays an important role in ensuring the NZD is New Zealand's primary currency. This is called the 'value anchor' role. Cash, either physical or digital, also ensures that everyone can make and receive payments and participate in society.**
- **People are using cash less, and the role of central bank money in New Zealand as a value anchor is under threat. New Zealand's money should innovate to stay relevant and useful, and in doing so ensure our monetary sovereignty.**
- **Globally a new wave of digitalisation is rapidly changing the nature and use of money and payments. The technology of central bank money may need to evolve to carry the benefits of cash into a digital future.**

- **Given this, our objectives for digital cash are to:**
  - **ensure that central bank money is available to New Zealanders and allow it to be used digitally.**
  - **enable a money and payments system that is innovative, competitive and contributes to the development of New Zealand's digital economy.**
- **We are not alone. Many other central banks are also considering issuing their own versions of digital cash.**

### Central bank money is a value anchor for New Zealanders

Central bank money plays an important value anchor role. This means it ensures the NZD is our only currency and that all forms of NZD can be equally exchanged for one another. This creates uniformity of money. This means one New Zealand dollar held in a bank will be worth the same as one dollar in cash or one dollar held in a different bank. Uniformity of money is important for consumer confidence. It makes it easier to determine the worth of goods and services you are purchasing.

The availability of cash to the public is important for uniformity. It means that people can withdraw their bank deposits into cash at any time. Central bank reserves also enforce this uniformity at the wholesale level.[2]

It also protects our monetary sovereignty. That is our ability to influence interest rate settings, and economic activity because economic activity is conducted in NZD. The uniformity of money and New Zealand's monetary sovereignty is taken for granted today but has not always been the case historically. The Reserve Bank was established in 1934 to issue currency and conduct monetary policy. Prior to that notes were issued by trading banks. Once established, the Reserve Bank issued currency that replaced all trading notes. The Reserve Bank continues to have monopoly powers over issuing banknotes and coins.

### Central bank money contributes to social and financial inclusion

Central Bank money also provides an alternative to private money. It allows people to choose to hold their money with private entities or hold money in the safety of central bank money. This safety is important to some people, particularly in times of crisis. People do not have to worry about the Reserve Bank failing. The choice to hold central bank money is essential for the approximately 50,000 people over 16 years old that cannot, or do not, have a bank account in New Zealand.[3]

## 3.1 Trends in New Zealand's money and payments

There are two trends that challenge the uniformity of New Zealand's money: the decreased use and availability of cash, and the emergence of new types of assets that may not be denominated in NZD.

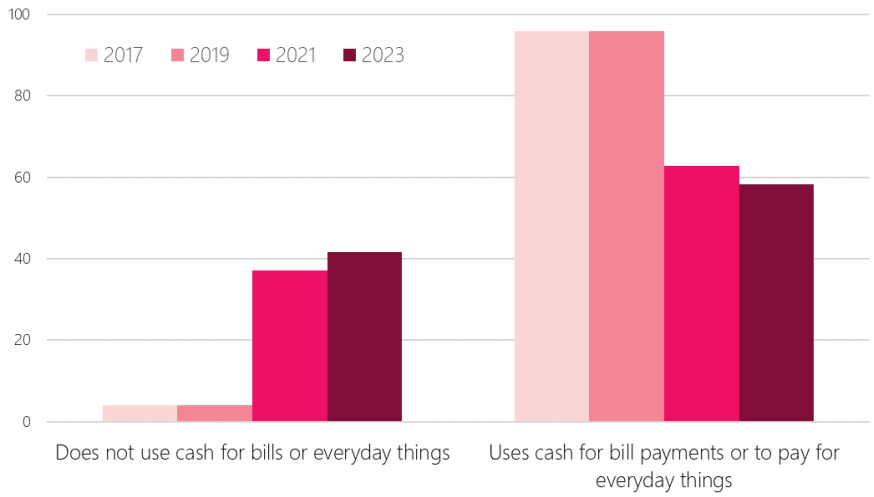
### Cash is used less frequently and harder to access

Cash is no longer a core payment medium for many people. The frequency of cash use by New Zealanders continues to fall. Our recent cash use survey (2023) shows that the use of cash for

2 Garratt et al. (2023) define the singleness of money as an unambiguous unit of account that underpins all economic transactions in society.
3 Demirgüç-Kunt et al. (2022).

regular bills and everyday things has fallen significantly in 2021 and 2023, compared to pre-Covid-19 levels.

***Figure 2: Cash use for regular bills and everyday things***




Source: Reserve Bank cash use survey (2023) *forthcoming*.

The trend in figure 2 is due to both changing payment preferences and reduced access to cash. Many people are finding it harder to withdraw and deposit cash from banks, and some retailers are no longer accepting cash.

But we know from talking to New Zealanders that cash is still important to them. For example, many people value the option of being able to use cash and find it very important to be able to use it for koha, markets and school fairs, short terms savings, payments to children and in case of emergencies. Many people expressed discomfort about the declining use of cash because they want to be able to use it when it suits them. People are also concerned for those who still rely on cash. As both cash and digital transactions are beneficial, there is a role for both physical and digital cash in New Zealand's future.

*"What about school fairs? I'm on the PTA and we rely on cash for that, people give their kids cash to spend."*

*"I would love to use cash but it's just not convenient having to go and get cash out."*

Cash is also used in the hidden economy.[4] In our research, the anonymity of cash appealed to some people and the ability to avoid declaring income was commonly referenced as a (personal) benefit of cash.

People also said they prefer to use digital payments for most of their transactions. They cited convenience, ease, availability, safety, and budgeting among other reasons. Merchants and small

4 The hidden economy refers to economic activity that is deliberately concealed from law enforcement and tax agencies. It includes illegal activity, tax evasion, tax avoidance, and informal activity. Both cash and private forms of digital money play a role in the hidden economy.

business owners expressed a preference for digital transactions. Digital transactions took less time to process, required less management, and had a lower risk of loss or error than cash transactions.

### Innovation in money and payments challenges monetary sovereignty

We have also seen emerging innovations in money and payments. These include cryptoassets, distributed ledgers, smart contracts, digital currencies issued by global technology companies. It also includes central bank digital currencies being considered by other countries.

If innovation only occurs outside of NZD forms of money, New Zealanders may use other currencies for their transactions. For example, when they want a more sophisticated or convenient payment option. If other currencies become more popular than the NZD in New Zealand, then we could lose our monetary sovereignty. This would reduce our ability to influence interest rates, and economic activity. The Reserve Bank and New Zealand government has less (or no) influence over currencies outside of the NZD. Losing our monetary sovereignty has a small probability but would have a large impact.[5] Digital cash can ensure innovative payments services occur in NZD which protects our monetary sovereignty.

We also have an opportunity to innovative central bank money. As well as to improve future efficiency and drive innovation in New Zealand's money and payments. New Zealand's payments landscape is dominated by a small number of large players. The barriers to entry are high and New Zealand's payment services have become less innovative than other countries. Digital cash would help bring down barriers to entry to the payments system. Digital cash would also be a new piece of digital public infrastructure that supports digital transformation in New Zealand.

## 3.2 Digital cash can preserve and evolve the role of central bank money

Central bank money must adapt to a changing economy and society. It must ensure New Zealand has reliable and efficient money and payments systems that support innovation and inclusion. Being clear on the role of central bank money into the future is critical and will shape money and payments for decades to come. Much remains at stake:

- Preserving monetary sovereignty
- Ensuring monetary policy effectiveness and financial stability
- Providing choice and competition
- Addressing unintended barriers to payments
- Supporting digital transformation and innovation.

Evolving central bank money could preserve our influence over New Zealand's money systems and provide stabilising support for conventional and new forms of private money. Issuing digital cash would enable the Reserve Bank to achieve the following objectives and outcomes.

5 Reserve Bank (2022b).

***Figure 3: Digital cash objectives and outcomes***


The first objective speaks to the role of central bank money as value anchor for money in New Zealand. It recognises that the Reserve Bank has a comparative advantage in providing a stable and trusted form of money. We also have experience providing secure reliable critical national infrastructure. The second objective speaks to the opportunities that digital cash can bring to New Zealand.

## 3.3 Central banks are investigating digital currency

New Zealand is not unique in investigating digital money. Most central banks are investigating issuing their own digital money. In 2022, 93 percent of 86 central banks surveyed by the Bank for International Settlements were investigating their own digital forms of money.[6] The range of motivations span considerations of monetary policy implementation, financial stability (including trends in cash and value anchor concerns), payments safety and efficiency and financial inclusion.

Bahamas, the Eastern Caribbean Central Bank, Jamaica, and Nigeria have launched central bank digital currencies that are still in circulation. At the time of publishing, no advanced economy central bank has issued a digital form of money to the public.[7]

The Bank of England, European Central Bank and Sweden's Sverige's Riksbank are considering issuing their own digital money to the public to ensure they retain the value anchor role of central bank money, and capture opportunities for improved innovation and inclusion.

The Reserve Bank of Australia (RBA)[8] has recently engaged in a pilot with industry to investigate potential uses and benefits of a new form of digital money issued by the RBA. The use cases that were piloted focused on wholesale payments rather than payments made by everyday people. Australia has a fast payment system that allows instant electronic payments between people, which New Zealand does not. Australia has also not had as big of a fall in cash use compared to New Zealand. The RBA has not yet confirmed any public policy case for the introduction of digital money for general use. The RBA and the Australian Treasury expect to publish a joint report

6 Kosse et al. (2023).
7 Several countries that have launched central bank digital currencies as experiments or pilots. Ecuador's dinero electronico was launched and cancelled a year later due to distrust in the currency. See Mikhalev et al. (2024).
8 Digital Finance Cooperative Research Centre et al. (2023).

around the middle of 2024 that will provide a stocktake on digital money research in Australia and set out a roadmap for future work.[9]

The People's Bank of China is also exploring issuing digital money to its citizens with a pilot called the e-CNY. As of June 2023, it had issued e-CNY into more than 120 million individual wallets and conducted 950 million transactions in e-CNY worth approximately 1800 billion yuan (≈$251 billion).[10]

# 4 Benefits to the payments landscape and economy

- **Digital cash can contribute to the innovation, efficiency and reliability of New Zealand's money and payments.**
- **The digital cash platform would be an open platform. Service providers would connect to it to provide payments services. This would increase payments competition and lead to more innovation.**
- **The digital cash payment platform also improves the reliability of New Zealand's payments landscape. It would give people another back-up payment in case one of their payment methods is unavailable.**
- **Digital cash is reliable because it has the lowest credit risk. People do not need to worry about losing their digital cash value due to a service provider collapse. The value of their digital cash can always be redeemed by the Reserve Bank.**
- **You can find more information in the Innovation and reliability opportunities for digital cash - Digital Cash Consultation Note.**

## 4.1 Digital cash can improve efficiency through greater competition and innovation

Like most economies, New Zealand has high concentration in the number of private entities that issue electronic money and conduct payments. This enables a network where people can be confident that their money will be accepted. They can also be confident that the way they choose to make their payments will also be accepted. For example, you can be confident that your supermarket will accept money issued by your bank, and let you use your debit card to pay.

Transactional bank accounts are at the centre of digital payments. Banks issue digital money into transaction accounts, and people instruct digital payments to and from transaction accounts. The bank account number structure that sits behind transaction accounts, enables efficient, trusted and predictable payments across New Zealand. However, it also means that access to New Zealand's payments landscape is highly reliant on access to transaction accounts.

9 Reserve Bank of Australia (2023).
10 Ledger Insights (2023).

After talking to firms in the payments and financial technology industry, we confirmed that many firms find it difficult to enter New Zealand's payments landscape. These firms encounter challenges in connecting to important payment processing services and systems at the 'back-end' of the payments landscape. For example, firms that want to become a direct participant of critical payments systems. They also encounter challenges accessing customer information and payments instruction systems at the 'front end' of the payments landscape. For example, firms that want to provide overlay payments services need access to customer data in transactional bank accounts.[11] This results in few new service providers entering New Zealand's payments landscape. Low competition in payments means that New Zealanders are not getting the best deals and services.

There are initiatives underway, including the API Centre, open banking, Payments NZ's next generation payments, and the Exchange Settlement Account System (ESAS) access review that have the potential to improve access to both the front and back end of the payments landscape.[12] The benefits of these initiatives are yet to be fully realised and depend in part on the cooperation of existing banks.

**Box A: Feedback from financial industry workshops**

In 2022, the Reserve Bank held technical workshops with financial firms on the innovation and interoperability aspects of digital cash issued by the Reserve Bank.[13] Three workshops were held separately with commercial banks, financial technology firms (fintechs), and payment service providers (PSPs). Insights from these workshops are summarised below.

- In general, fintechs and PSPs felt that central bank issued digital money could support improvements in payments functionality by the features and functionalities embedded in the digital cash itself (i.e. on data capture and functionality). This may in turn support innovation in other payments services that might use digital cash, and support innovation in other services more generally.
- Fintechs also noted that central bank issued digital money could improve consumer confidence, safety and trust in new money and payments services. In particular, it could provide end user benefits in the form of better identity management, a trusted asset, safety, and inclusion.
- PSPs noted that central bank issued digital money could provide an additional payments settlement platform for fintechs to use, would support greater payment functionality, and bring New Zealand back to being an innovative world leading digital payments nation. In addition, they noted that many technologies are being underused by the current market providers but could be used to support innovative outcomes.

11 Overlay services refer to the services that third parties can provide by building on top of existing front-end payment infrastructure and services. Overlay services might focus their business model on a particular aspect (or aspects) of the payments process, such as enrichment services or integrating the payments process with other areas of business activity. See Dudson et al. (2022).

12 See rbnz.govt.nz/have-your-say/2023/esas.

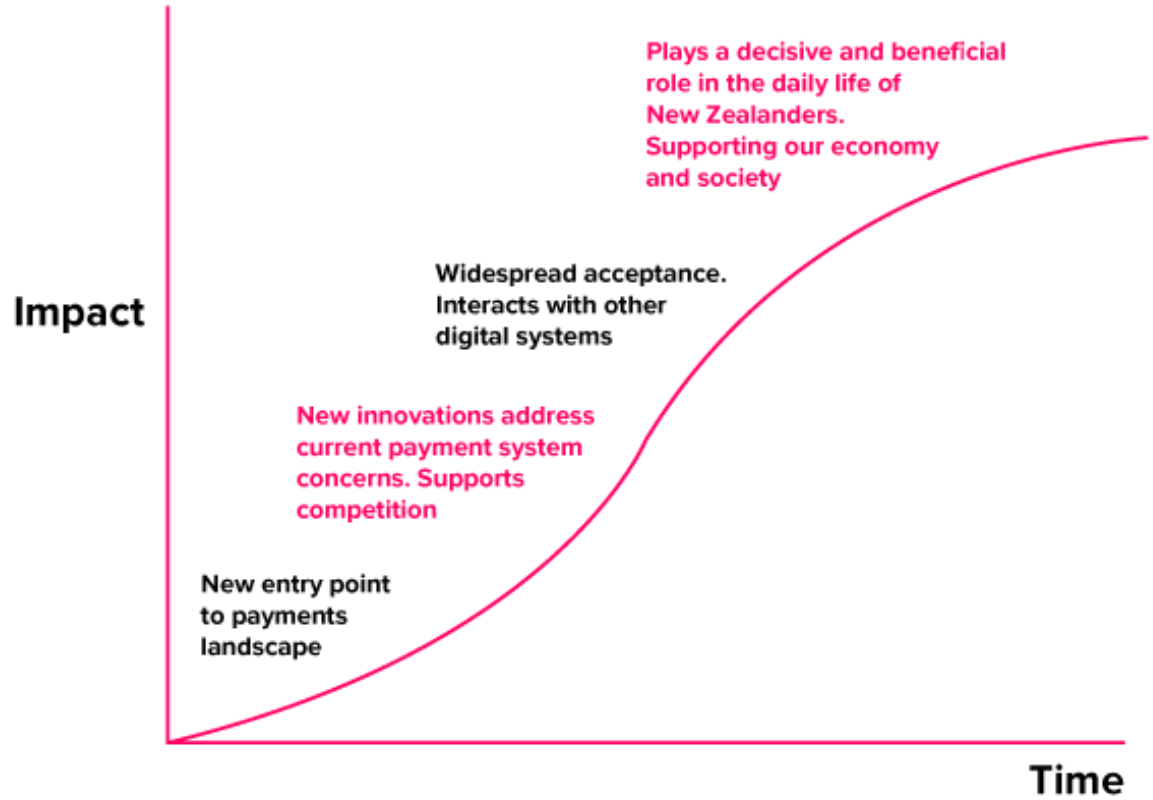
13 Note, in the workshops the term 'digital cash' was not used, instead we referred to a more generic descriptive terms of a 'central bank digital currency'. In addition, less details were known about the strategic design of the digital currency at the time of the workshops.

Access barriers to New Zealand's payment landscape reduce market competition. Competition is important for improved services and pricing.[14] The Reserve Bank is concerned that New Zealand's banking and payments industries have fallen behind internationally.[15] For example, New Zealanders still do not have the ability to make instant payments electronically to other people (unless they are both with the same bank).

Digital cash would provide new entry points to New Zealand's payment landscape for new service providers. It would do this by providing an open, interoperable, and safe payments platform that can be accessed by banks and other third parties to provide a wide range of digital cash services. This would support greater payment functionality and assist with bringing New Zealand back to being an innovative world leading digital payments nation.

Digital cash and its platform could accelerate the adoption of advanced digital technology across New Zealand. This can benefit our productivity.[16] Over time as use of digital cash grows, and more service providers build onto the platform we can envisage a future where digital cash plays a transformational role in the New Zealand economy (Figure 4).

***Figure 4: The potential transformational impact of digital cash in New Zealand***




Source: Reserve Bank.

14 Dynamic efficiency is linked to the pace of innovation in a market over time. There is an opportunity to improve dynamic efficiency in New Zealand by reinvesting the high profits of the banking system back into technological development.

15 It is the Reserve Bank's view that New Zealanders and the New Zealand economy should benefit from modern real time account-to-account payments capability. If it is well designed, implemented and governed, it should improve the levels of innovation and competition across the payments landscape. However, we do not see any critical dependency between digital cash and a real time account-to-account payment system. See Silk (2023).

16 Yashiro et al. (2022).

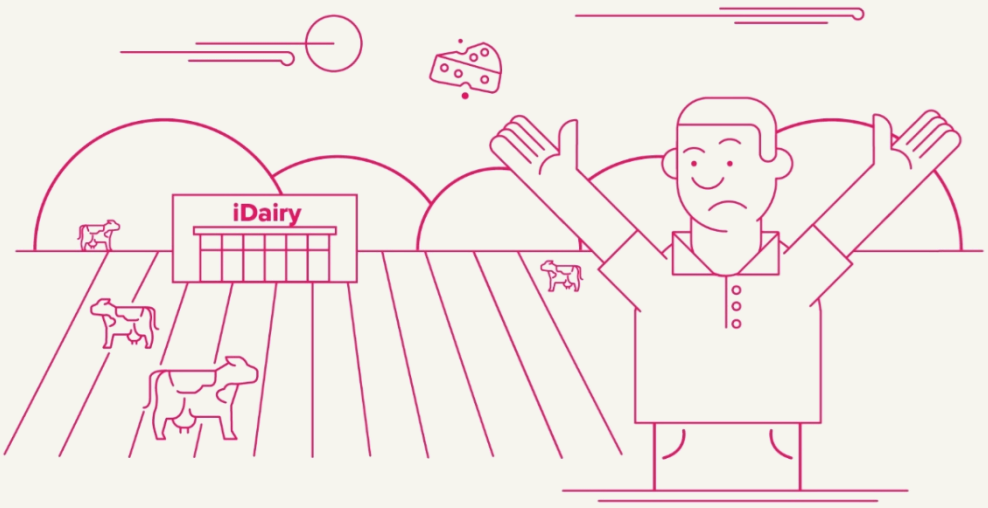
**Box B: Illustrative user story. Programmable payments bring business efficiencies[17]**

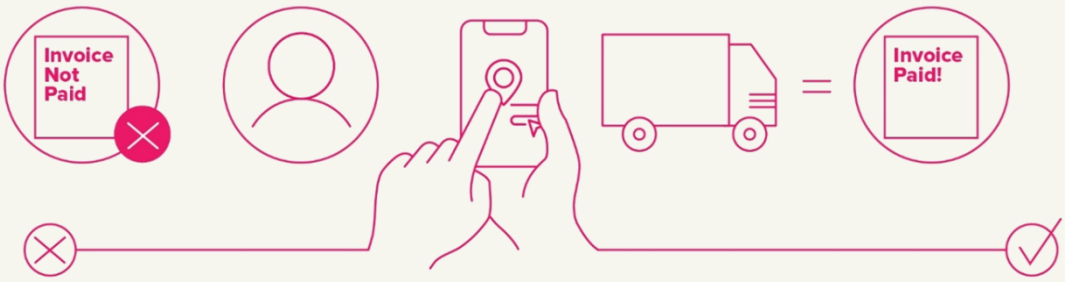
Hone owns a small New Zealand dairy factory that serves local customers.

He usually receives payments from his sales a month after delivery. The timing of when he receives the payments often changes. Hone has sophisticated sales delivery and tracking systems, but they are not connected to his financial systems. Hone also has many suppliers that need to be paid on time. He receives invoices from his suppliers at different times, which makes it hard for him to keep on top of his accounts. He would like to better match his sales with his deliveries to help him pay his invoices on time.

Hone decides to open a digital cash account for its smart contract functionality. He uses this to send a conditional payment request to his customers. The customer authorises the conditional payment and locks the digital cash funds that will be used to make the payment. With the payment embedded in a smart contract, Hone sends the customer their order. He uses his tracking systems to confirm that the order has been delivered, and then releases the payment.

The conditional payment functionality gives Hone more certainty around when he will be paid and puts him in a better position to manage his businesses.



### How would digital cash drive more innovation in payment services?

We can use the illustration of GiveBetter and NoScam to look ahead and imagine some of the new services that could be created using digital cash.

#### GiveBetter offers new donation services

i. GiveBetter is a small payments start up firm. It wants to help charities accept digital donations for a lower fee.

ii. It knows that donations given through existing digital apps charge high fees. These are due to card fees and the app provider fees.

iii. It also knows that internet transfers can be clunky and are not convenient for one-off donations like street collections.

iv. GiveBetter sets up a digital cash giving app. It has no card fees and sets a small processing fee.

v. Charities sign up to GiveBetter. They can request digital cash donations using a simple QR code at a fraction of the fees of other donation apps.

#### NoScam offers fraud protection

i. NoScam wants to help protect everyday people from online fraud.

ii. It sets up a service that confirms the identity of people and businesses that receive digital cash. This protects people from scammers who are pretending they are trusted parties like government agencies.

iii. This service works in the background of digital cash wallet apps. People can select the NoScam service to check whether the people or businesses they are sending digital cash to are who they say they are. NoScam checks the payee's actual identity against what they have told the payer.

## 4.2 Digital cash can improve reliability of money and payments

Digital cash can also improve the reliability and innovation of money. It would be the lowest risk form of money and the digital cash platform would build additional resilience into the payments landscape.

Digital cash would not be exposed to credit or settlement risk.[18] As mentioned it would be issued by the Reserve Bank, making it low credit risk. The platform would settle payments in real time making it low settlement risk. This means it would carry less risk than other forms of digital payments, particularly cryptoassets or stablecoins which the Reserve Bank do not regulate. Digital cash may be a more attractive option for service providers who are currently using cryptoassets or a stablecoin to deliver their innovative services.

[17] Adapted from Accenture et al. (2024).

18 Credit risk refers to the risk that the issuer could fail and lose people's money, settlement risk refers to the risk that the payer (or the payers bank or money issuer) loses the funds to settle the payment in the time in between authorising the payment and when the money changes hands.

In addition, digital cash would also provide another secure transfer platform. It would add choice to New Zealand's payments and address several single points of failure. For example, the ESAS is New Zealand's only settlement system. ESAS is resilient because it has multiple layers of back-ups built into it.[19] However, a digital cash platform would provide additional resilience to New Zealand's payment landscape by adding another settlement system.

Currently, there are few alternative payment methods for people when their preferred payment method has an outage. For example, if there was a cyberattack or operational failure on a particular payment system. Physical cash is a good backup form of payment. But to be useful, people need to already have the cash they might need. This is particularly true if there is an electricity or internet outage that affects ATMs and bank branches. We saw this during the aftermath of Cyclone Gabrielle. Digital cash can provide a personal payment back-up for individuals if other digital payments are down. Digital cash will also have a new feature of being able to be used without power or internet. A digital cash offline feature would work using locally stored balances on a device or card, and Bluetooth technology to transfer them to other devices or cards.

19 See Dudson et al. (2022) for a description of the payments landscape and key systems.

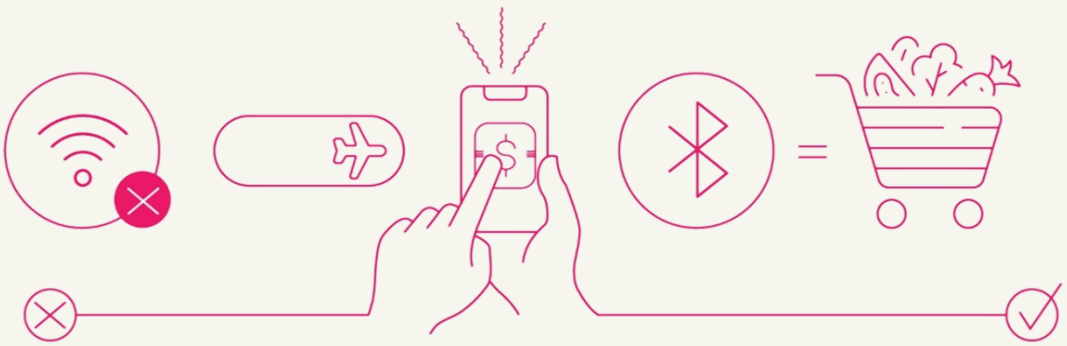
**Box C: Illustrative user story. Digital cash increases resilience through enabling offline payments**

Leilani lives in a small town in New Zealand. Leilani's town has a history of severe weather events, and the mobile phone reception is sometimes patchy. During past severe weather events, her community has lost internet access and had poor mobile phone coverage. The EFTPOS systems also went down. This made it hard for people to buy food and essential supplies, and businesses could not take payments.

With digital cash, Leilani and her community would be able to use it in 'offline mode' to make payments, if the internet or power went down. This means, Leilani and her community will be able to buy critical items from shops and transfer money to pay for them. They can also use their mobile phone to pay, or use a physical card, like a secure smart card. They can do this by downloading digital cash to their phone or card, then use Bluetooth to transfer it from one device to another.

By accepting offline EFTPOS payments, local shop owners and retailers in the affected area can remain open and continue to provide needed supplies. This will make communities more resilient during a severe weather event, or in an emergency.

Smart cards will give people who are less comfortable with making digital payments an option to access digital cash. This means everyone will have more choice in how they make payments.

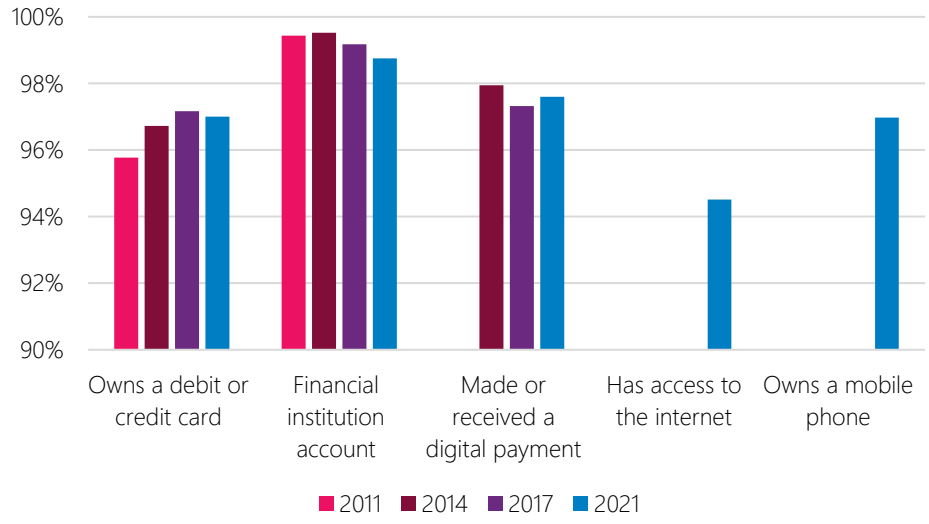


# 5 Supporting greater digital financial inclusion

- **Digital cash can enhance digital financial inclusion in New Zealand by offering greater consumer choice such as basic money and payment services and offline payments.**
- **As a digital payment option, digital cash may not suit people who prefer to use physical cash, additional wrap around services may be needed to support those who struggle with certain digital exclusions.**
- **You can find more information on the inclusion opportunities of digital cash and how they have informed our design direction in the Inclusion opportunities for digital cash - Digital Cash Consultation Note.**

Most New Zealanders have bank accounts and access to the internet or a mobile phone (Figure 5). But this is not the full picture of digital financial inclusion.

***Figure 5: New Zealanders use of financial products (% age 15+)***




Source: Demirgüç-Kunt et al. (2021)

People are digitally financially included when they can decide how they want to manage and spend their money and payments. This depends on having access to a range of choices of financial products and services they want to use, being able to afford these choices, and that the choices are suitable to their circumstances. It also relies on people's confidence to make their own choices.

When we consider inclusion in this way, there is room to improve New Zealand's digital financial inclusion. Many New Zealanders lack meaningful choice of digital financial products. For example, about 14 percent of households have no internet access,[20] 51,000 people are 'unbanked',[21] only 60 percent of New Zealanders have borrowed and only 69 percent have saved, at a financial institution.[22] In addition, people who have recently been made bankrupt find it difficult to access basic banking services, and face restrictions placed on access to online money and payments services such as internet banking.

20 Given the digital exclusion issues with the most recent census and the all-time low response rate, this is likely to be an under estimation. Statistics New Zealand (2019).
21 Demirgüç-Kunt et al. (2021).
22 Demirgüç-Kunt et al. (2021).

Many New Zealanders also lack confidence to choose what financial products and services they want. For example, 20 percent of New Zealanders have below essential digital skills.[23] In addition, under 69 percent of New Zealanders feel safe using the internet for online transactions and 5 percent of adults lack basic computer skills.[24] Only 67 percent of people report they trust banks,[25] 31 percent of people feel anxious speaking to financial service providers, 27 percent do not know how to compare products and 26 percent do not know how to find suitable products.[26]

## 5.1 Digital cash can improve digital financial inclusion

The Reserve Bank can use digital cash to improve digital financial inclusion. The private sector can also use their existing products and services to improve digital financial inclusion but are not always incentivised to do so. The Reserve Bank supports a money and cash objective of inclusive payments, among other things, and is more incentivised to consider digital financial inclusion.

Digital cash can provide a new option that overcomes current digital financial inclusion barriers. The Reserve Bank can prioritise access, and design features of digital cash so that it has:

- Inclusive consumer facing interfaces such as wallets, tokens, customer service, and on boarding. Interfaces can be used by anyone, and particular attention is given to reducing digital access barriers.
- Basic debit services that anyone, including those who have recently faced insolvency, can use.
- A range of services that meet the needs of those who are currently not served, or are underserved, by existing service providers such as banks.
- Simple and easy ways to swap between digital and physical cash and connect to existing payments services and other parts of the financial sector.
- Offline functionality so that people without a mobile phone or the internet can make payments and manage their money.
- Payments can be programmed to remove barriers created by manual processes and ensure there is no delay between when a payment is approved and when it is received.
- A user centric view that could support agencies to implement the Debt to Government framework if the individual consented to sharing their information in that way.[27]
- Wrap around support services to educate and help people learn how to use digital cash and support them if things go wrong.
- Careful use of personal and transactional information to unlock access to other financial services while preserving an individual's privacy and autonomy.[28]

In addition, digital cash may appeal to people who have low confidence or trust in banks or the private sector. If we succeed in designing it to be truly accessible, digital cash may also appeal to people who have not used digital payments before. As people learn how to use digital cash, they may begin to feel more confident about trying out other digital payments and financial services. And become more aware of the benefits of using these services.

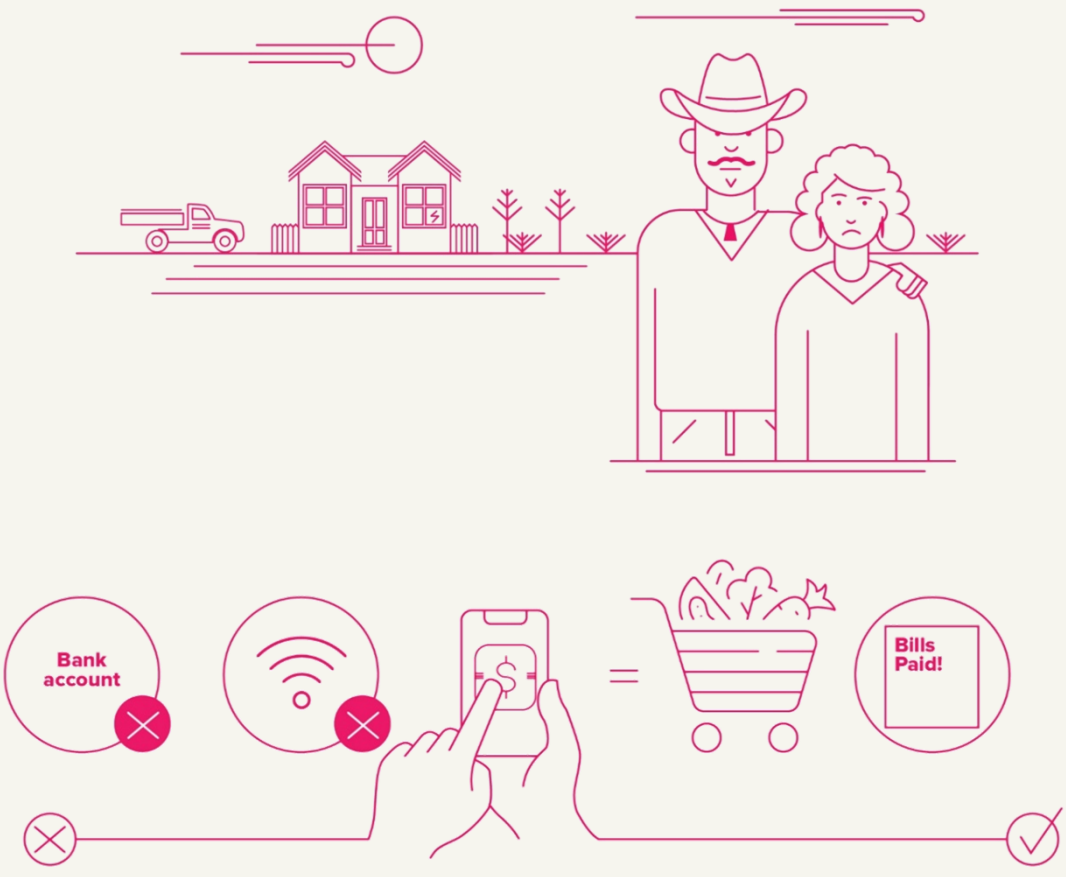
23 Essential skills include turning on a device, using the controls on a device, connecting to the internet by opening a browser, interact with the main screens on a device, update and change a device password, change the settings on advice to make it easier to use, plus at least one other skill. BNZ (2021).
24 MBIE and Ministry of Education (2016).
25 People for people (2022).
26 Ibid.
27 Inland Revenue Department (2023).
28 For example, an individual's transaction histories can be used to approve a new loan or insurance application, but they might also be used to decline a new loan or to exploit the user to purchase services they might not have otherwise purchase.

**Box D: Illustrative user story. Digital cash gives insolvent people access to online debit services**[29]

Sam and Belinda live rurally and applied for a loan to buy a new car. But they found it hard to keep up with the repayments and they now owe more for their car than what they paid for it. They spoke to a financial mentor, who advised them to apply for insolvency.

After applying for insolvency, they lost their bank account with their existing bank. They were able to open an account with another bank, but it does not have a local branch. The bank also restricted how they could use their account—Sam and Belinda were not given internet banking or mobile banking and were not allowed debit or credit cards. This means they could only use an EFTPOS card to buy things in shops and could not make online payments. They also had to do all their banking in person, at a branch, which was an hour away.

Sam and Belinda decide to open a digital cash account so they could have access to their money online and make online payments. The digital cash account is debit only and does not have any restrictions. Sam and Belinda can now have their wages and working for family's tax credits paid into this account, do mobile banking, and buy things online.




29 Story draws from Fincap (2023) and Christians against poverty (2020) which detail the restrictions people can face following bankruptcy.

# 6 Strategic design of digital cash

- **The Reserve Bank has made high level design choices digital cash. These choices reflect the objectives and outcomes that we would like a new form of digital money to achieve, and the potential benefits to New Zealand.**
- **The design of digital cash should be user centric, private, and deliver clear benefits to New Zealanders. It should also enable participation from the market, capture a high-level of innovation, and consider the impacts on other payments participants.**
- **You can find more information on our initial design considerations for digital cash and its ecosystem in the supporting consultation publications: Designing a digital cash ecosystem - Digital Cash Consultation Note; Designing privacy into digital cash - Digital Cash Consultation Note; Central Bank Digital Currency - Strategic Insights Dossier; and User needs for money management and payments - Qualitative research report.**

## 6.1 User centric design and benefits

Digital cash must benefit users to be worth adopting. Therefore, to design digital cash we must first consider the wants and needs of users. We have reviewed the submissions to our 2021 Issues Paper, additional consumer surveys and conducted market research in 2023 to better under what New Zealanders want from their money and inform our design options.

### What New Zealanders said they want from their money management systems

Money management is serious business to New Zealanders. Responses to the 2021 CBDC Issues Paper overwhelmingly said privacy and cash were very important. Our 2023 market research revealed that people valued easy control and clear oversight of their money systems.

Overall, New Zealanders are satisfied with their money arrangements and trust banks to do a good job of looking after their money and payments. Mobile banking applications and internet banking give people easy control, good transparency and oversight over their money. These tools empower people to manage their money and underpins satisfaction with banks. People appreciate the ability to schedule and pay bills online, and easily make transactions. They want to keep their money systems logical and simple – usually by keeping everything within one central bank account. In addition, the digital environment can feel like a risky place to some people and there is a general expectation that banks will continue to make improvements and innovations over time. Merchants such as sole traders and smaller charities feel certain pain points more acutely, because they bear the cost of transactions more.

New Zealanders also care about who is issuing their money and who is keeping it safe. They agree the Reserve Bank has an important role in money and financial stability and can provide the safest form of money to people.

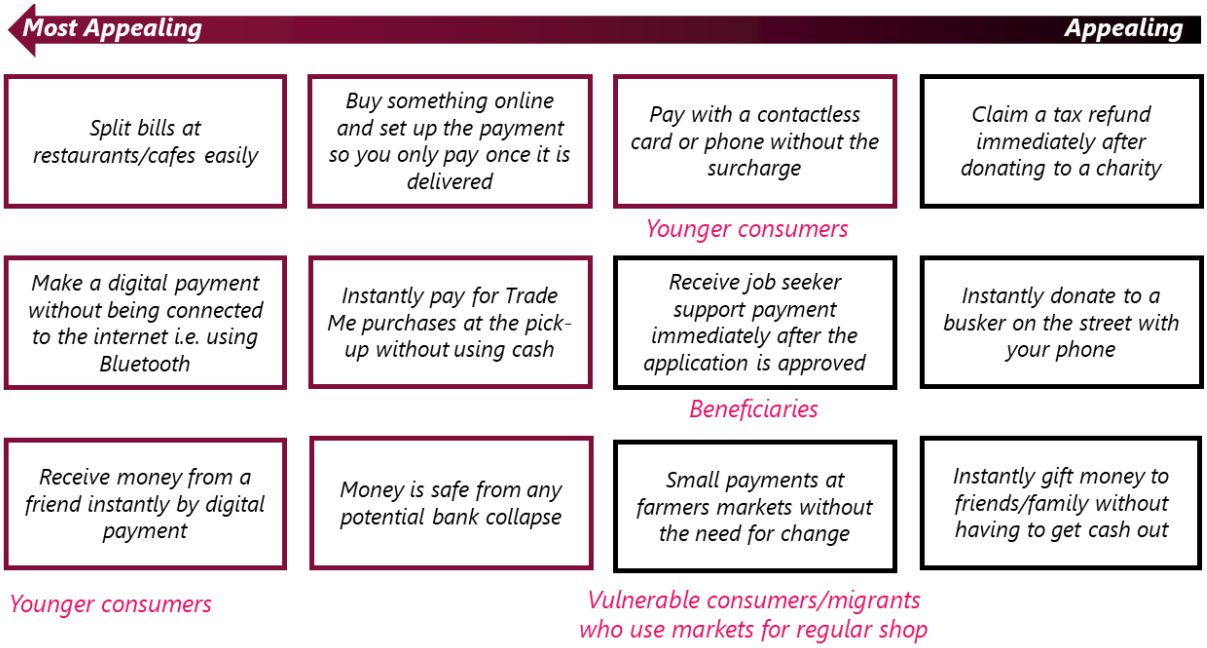
### Benefits to users

We expect that a range of different types of uses of digital cash will appeal to different types of people. However, we found that most people want to be able to make instant digital payments to other people. For example, some people were interested in instant gift giving or instant donations, while others are interested in the ability to instantly receive and make payments when buying items from online market at the point of exchange. In consumer interviews, some people reported

that they open accounts at multiple banks solely for the purpose of making immediate transfers to friends and whanau.

Other improvements that appealed to people included easier and cheaper international transfers, no surprise fees, better fraud and scams prevention, capturing the opportunity to improve learning and budgeting enablement (Figure 6).

***Figure 6: Appeal of digital cash use cases***




Source: GravitasOPG et al. (2023).

## Privacy and personal autonomy are key priorities

We heard New Zealanders tell us that privacy and autonomy is important to them. Privacy is used to describe concerns about how data is stored and used as well as broader concerns like government surveillance and control, programmable money, and restrictions on the ability to live freely.

Privacy is a multi-dimensional concept. It includes both informational concepts and contextual concepts.

- **Informational privacy.** This relates to use of data or information. It spans 'physical privacy' and 'personal data privacy' (or 'data privacy') and 'transactional privacy'. The Privacy Act (2020) defines and protects personal data privacy.
- **Contextual privacy.** This addresses freedom to live how you want to, and feelings of safety and trust. There are four aspects of contextual privacy: Te ao Māori, privacy for human dignity, as well as overlapping aspects of physical and transaction privacy. Contextual privacy needs go beyond the definitions of privacy in the Privacy Act.

  A te ao Māori perspective requires protecting both personal and collective privacy. A collective approach recognises and upholds collective rights over information in the same way as rights over personal information. Collective data can include whakapapa, genetic and genomic data which can be aggregated to 'represent' a collective and used to make decisions

that impact that group. Collective consent means ensuring that consent to hold, use, store or disclose data adequately represents the collective interests and risks including balancing benefits from sharing information with the potential harms from its misuse.[30]

The design of digital cash must ensure minimal data collection and embed appropriate personal and transactional data governance. It must also provide users with assurance that they have full control over their information, and autonomy in how they choose to store and spend their digital cash. This implies that there cannot be any constraints on the use of the digital cash such as 'programmable money' that would restrict certain purchases. Finally, it should protect New Zealanders personal autonomy and freedoms, human dignity and te ao Māori perspectives of privacy.

## 6.2 Asset, platform, and ecosystem design

At a more technical level we must consider the overall design of the digital cash ecosystem. A digital cash ecosystem is the environment of all the systems, services, roles, providers, and arrangements needed to deliver digital cash.

In 2023 we partnered with Accenture to consider the strategic design choices needed in this ecosystem. We also created potential digital cash use cases and explored the design choices with Accenture. To help guide our design choices we used our digital cash principles.

### Digital cash principles

The digital cash principles set out in Table 1 represent the digital cash objectives and desired outcomes we presented in section 3. They capture the public policy opportunities and challenges for New Zealand digital cash and translate them into design criteria. These principles were first presented in the 2021 Issues Paper and have been further developed since.

Table 2 uses the digital cash principles to define a set of strategic design choices for digital cash.

***Table 1: Digital cash principles***

| | Principle | Supporting criteria |
|---|---|---|
| 1 | **Uniform**<br>Digital cash will have the same dollar value as cash and bank deposits. It supports NZD as unit of account and our monetary sovereignty. | |
| 2 | **Universal**<br>Digital cash will be universal. Everyone will be able to use it for everyday payments and savings, just like with cash.<br>To achieve this, digital cash must be **inclusive**. | **Inclusive**<br>Everyone can access and use digital cash, in the same way that anyone can use physical cash to make a payment. This requires users to have meaningful choice, and autonomy.<br>• **Meaningful choice**: There is a range of money and payments products and services provided in the digital cash ecosystem. Physical cash is supported. |

30 Kukutai, T et. al (2023).

| | Principle | Supporting criteria |
|---|---|---|
| | | • **Autonomy**: Digital cash is trusted and can be used with confidence. Digital cash services are accessible, and information is easy to access and understand. |
| 3 | **Private**<br><br>Your information and lives will be kept private, and not influenced by the Reserve Bank when using digital cash.<br><br>To achieve this, we must build in **information governance** and **assurance**. | **Information governance**<br><br>Your privacy will be protected by the Privacy Act and good data governance principles.<br><br>The Reserve Bank will collect as little data as possible and won't be able to see your personal information or how you spent your money. You will have a choice on how your information is used, stored, shared, and deleted.<br><br>Digital cash will uphold Māori data sovereignty.<br><br>**Assurance**<br><br>You can feel confident in your freedom and rights when using digital cash. |
| 4 | **Innovative**<br><br>Digital cash will be innovative and support new and improved ways to make payments.<br><br>To achieve this, digital cash must be **efficient** and **feasible.** | **Efficient**<br><br>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.<br><br>• **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.<br><br>• **Interoperability**: Digital cash is compatible with different payment devices and systems in New Zealand.<br><br>**Feasible**<br><br>Digital cash and its ecosystem of services can be delivered in New Zealand. Service providers are incentivised to be involved in the ecosystem. This requires digital cash to be simple and have balanced incentives.<br><br>• **Simple**: Digital cash should be simple to design, develop and implement.<br><br>• **Balanced incentives**: Service providers — banks, payment companies, and new providers — will deliver digital cash services in a sustainable and efficient way. |
| 5 | **Reliable**<br><br>Digital cash will be reliable – so you can trust that your money remains safe | **Resilient**<br><br>Digital cash can recover quickly if it's exposed to risks or outages.<br><br>**Safe** |

| | Principle | Supporting criteria |
|---|---|---|
| | and payments can be made when you want to.<br><br>To achieve this, digital cash to be **resilient** and **safe**. | 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.<br><br>• **Final**: Once you make a payment, it can't be reversed or reclaimed.<br><br>• **Compliant**: Digital cash will need to comply with all relevant legislation and regulations. |
| 6 | **Orderly**<br><br>Digital cash will be issued by the Reserve Bank in an orderly way to minimise disruption to the financial system and economy.<br><br>To achieve this, we must monitor **stability** and maintain **controls.** | **Stability**<br><br>The Reserve Bank will monitor the impact of issuing digital cash on financial conditions. This includes monitoring whether commercial banks can get enough funding to conduct their businesses.<br><br>**Controls**<br><br>The Reserve Bank can control the timing, speed, and amount of digital cash in the economy and will make sure the financial system remains stable. |

***Table 2: Application of the principles to strategic design choices***

| | Principle | Digital cash strategic design choices |
|---|---|---|
| 1 | **Uniform** | • Any interest earned or fees charged would be to the balance of funds, not on the asset itself.<br><br>• There are no features designed to constrain what digital cash can be spent on (the asset is not programmable). |
| 2 | **Universal** | • It will be available on a range of devices and media.<br><br>• It will be easy to use and accessible for all people. |
| 3 | **Private** | • The Reserve Bank will not see personal or transactional data.<br><br>• The Reserve Bank will embed fit-for-purpose data governance, including Māori data governance pou, that service providers must follow.<br><br>• Any digital cash service provider will give users control and assurance over how their information is collected, stored, used, shared, and deleted.<br><br>• Other government agencies (such as Police and IRD) must use legal mechanisms to access any personal or transaction data held in an individual's device or online wallet. |
| 4 | **Innovative** | • It will be provided via a multi-tiered ecosystem. The Reserve Bank will deliver the core infrastructure (the asset and the platform) and service |

| | Principle | Digital cash strategic design choices |
|---|---|---|
| | | providers will offer digital cash services such as customer onboarding and online wallets.<br>• The multi-tiered ecosystem will be designed to encourage competition in the money and payments landscape.<br>• Consumer needs will be prioritised in the development of core infrastructure.<br>• It will provide a fast, convenient, and efficient way to pay. This includes instant payments.<br>• You can easily use in ways that you are already familiar with, and in new ways if you want to. It will work with existing payment technologies like at the point of sale.<br>• You can easily swap digital cash for other forms of NZD, such as physical cash or money in a transaction account.<br>• The core platform is flexible, highly interoperable, scalable, cost effective and sustainable over time. |
| 5 | **Reliable** | • It is resilient to cyber-attacks and double spending.<br>• You can make payments without having access to the internet.<br>• It has a clear and comprehensive governance framework including policies regarding issuance, data use, risk management and responsibilities.<br>• It is compliant with relevant legislation such as the Anti-Money Laundering and Countering the Financing of Terrorism (AML/CFT) Act 2009. |
| 6 | **Orderly** | • Initial issuance is gradual and monitored for any stability impacts.<br>• It is issued in exchange for Exchange Settlement Account System reserves at the Reserve Bank or physical cash.<br>• There will likely be no limits on how much digital cash individuals can hold, but we may need to consider limiting holdings owned by corporations and wholesale institutions. |

## Māori data sovereignty

Māori data sovereignty (MDSov) refers to the inherent rights and interests that Māori have in relation to the collection, ownership and application of Māori data. It is closely connected to Māori data governance which is the processes, practices, standards and policies that enable Māori, as collectives and as individuals, to have control over Māori data. Māori data sovereignty also recognises and upholds collective data rights.

The design of digital cash will also follow the Māori data governance pillars set out in Kukutai et. al (2023). The Reserve Bank would work closely with representatives of this framework to ensure that it is implemented fully in a digital cash ecosystem.

## Design models

We have categorised the overall design of a digital cash ecosystem on two dimensions (Figure 7). The horizontal dimension represents the level of functionality built into the digital cash asset platform provided by the Reserve Bank.

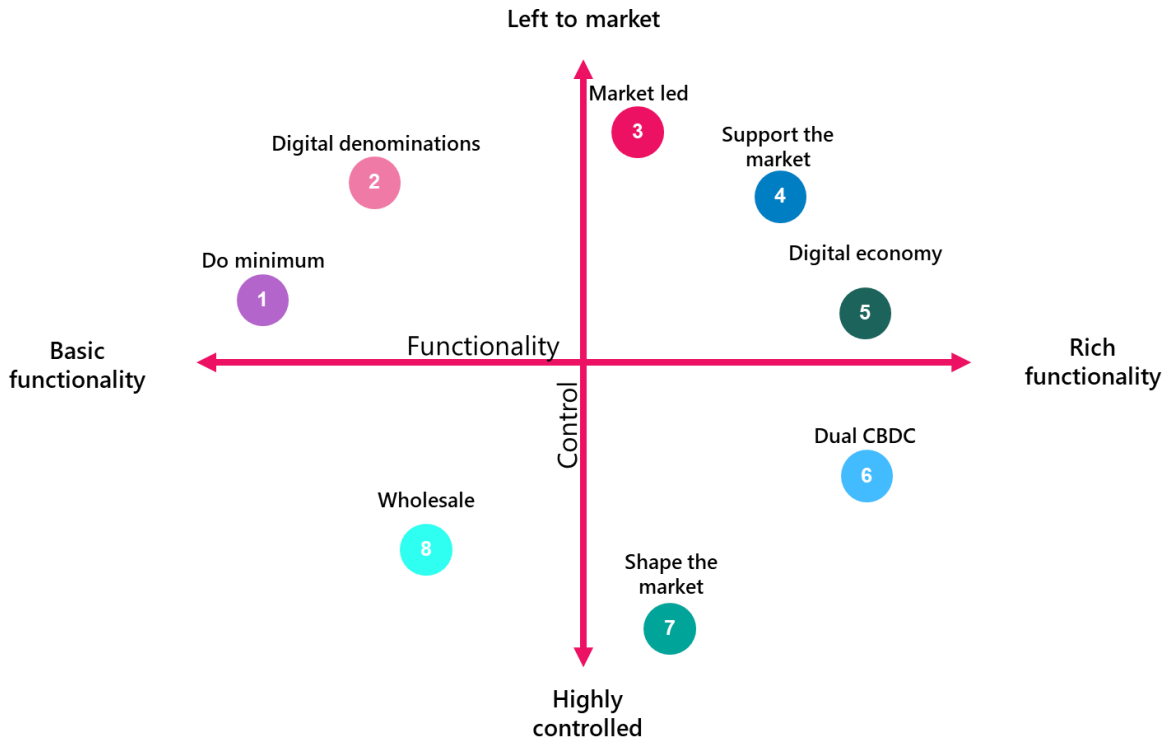
- The Reserve Bank can build a simple asset and platform and leave many services and functions for the market of service providers to design and build (left side); or
- the Reserve Bank can build an asset and platform that can already do many different things (right side).

The vertical dimension represents how much independence is given to the market to deliver services in the ecosystem.

- The Reserve Bank can give the market lots of freedom to decide what types of digital cash services it will provide, how, and what they look like (top half); or
- the Reserve Bank can highly control what services the market provides, how and what they look like (bottom half).

We developed eight potential digital cash models within each quadrant in Figure 7. These models are based on other central bank digital money experiments as references. Table 3 describes each model in more detail.

***Figure 7: Mapping of representative digital cash models***




Source: Reserve Bank (2024a).

***Table 3: Design models for central bank issued digital cash***

| Model | Description |
|---|---|
| Do minimum | The simplest possible digital cash model. The Reserve Bank issues only the core systems and functions but keeps flexibility to expand on these functions later. Retail use cases are prioritised, and the ecosystem is less defined. |
| Digital denominations | A model that replicates the fixed denominations of physical cash $0.10, $0.20, $0.50, $1, $2, $5, $10, $20, $50 and $100. It would require payments in these denominations and 'change' to be given. It includes offline capability but is less flexible to other innovations. |
| Market led | The Reserve Bank provides a basic platform and allows it to be widely accessed. Service providers (not the platform) hold and manage user information and transactional activity. There are many roles in the digital cash ecosystem that are left to the market. |
| Support the market | The Reserve Bank and the market of service providers collaborate to provide tools and functions in the digital cash ecosystem. There is wide access to a feature-rich digital cash platform that provides functions designed to support and accelerate innovate products and services. |
| Digital economy | The digital cash platform has an open architecture and many features to support all uses. It is highly integrated with other digital economy systems and stakeholders. |
| Dual CBDC | Service providers hold wholesale digital cash and use it to issue retail stablecoins that are highly innovative. |
| Shape the market | The digital cash platform and rules are provided by the Reserve Bank in a highly regulated and controlled environment. The rules set out the price arrangements, services (including customer), and user safeguards. |
| Wholesale | Digital cash acts as an innovation layer on top of existing payment systems to provide enhanced services to financial institutions already in payments systems. This includes a cross-border bridge to support better international transfers. |

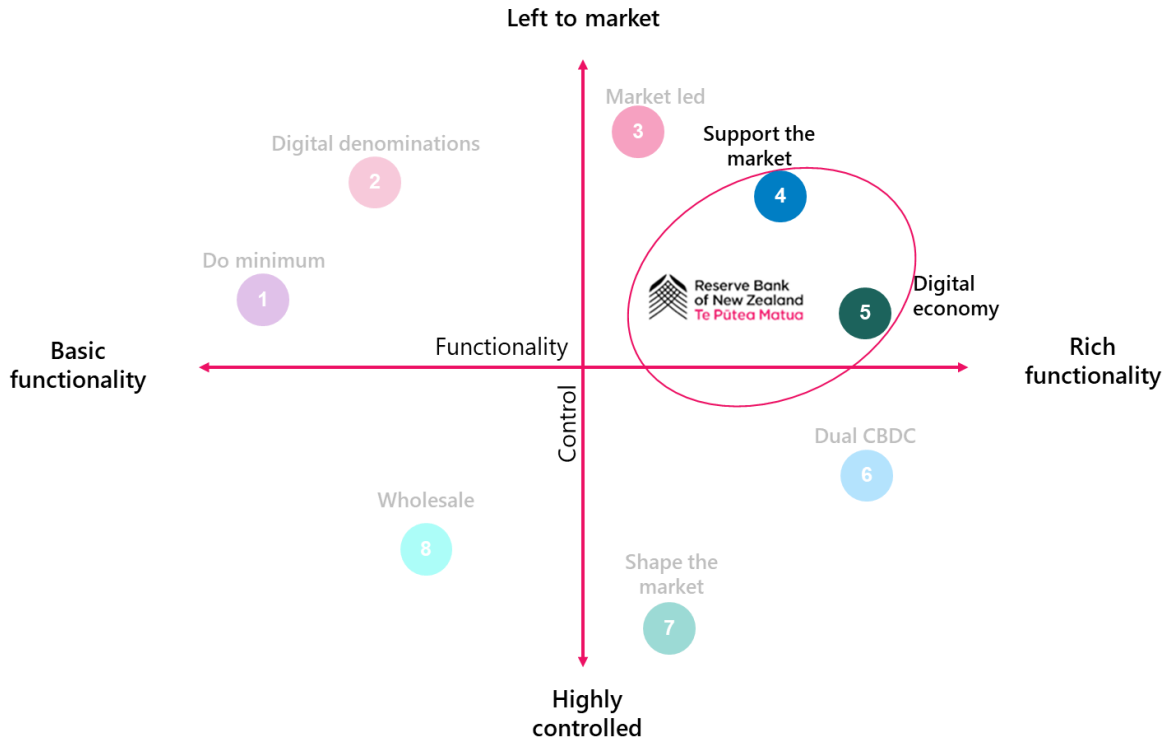
Source: Reserve Bank (2024a).

The models that meet our policy and strategic objectives are highlighted in the pink circle in Figure 8. They are user centric, enable participation from the market, capture a high-level of innovation, and consider the impacts on other payments participants.

We are considering a delivery approach that allows the market to deliver many different services, in the digital cash ecosystem. The Reserve Bank would provide a digital cash platform that has built-in functionality to encourage a diverse and rich ecosystem. The Reserve Bank would also set the guard rails for how the market can operate in the digital cash ecosystem. This approach prioritises open competition and a dynamic market, while ensuring the remaining digital cash principles are achieved.

We are also considering digital cash models that can achieve widespread use in the economy and relatively quickly. This requires models that are flexible and sustainable, and give enough incentives to service providers, who will then use the digital cash it to achieve their own goals.

*Figure 8: Reserve Bank's preferred design positioning*




Source: Reserve Bank (2024a).

### Digital identity is a core function

Digital identity is important for the digital cash ecosystem.[31] Different forms of digital identity could be used to access digital cash services. For example, to open a new account, to instruct a payment. Digital identity services may also be used for compliance checks, and other services. Market services providers would be responsible for digital identity services. The Reserve Bank would not collect any digital identity information.

The Department of Internal Affairs (DIA) is working on digital identity services. This work includes providing identity checks and verified credentials for New Zealanders. These services could also be used in the digital cash system. The DIA is also developing a 'digital identity services trust framework'. This framework would certify digital identity service providers. These certificates help consumers decide which digital identity service provider they can trust.

## 7 Issuing digital cash and impacts on bank funding

Digital cash would be issued onto the Reserve Bank's balance sheet. Holders of digital cash, such as you and I, would then have a claim to this digital cash. This is what makes digital cash backed by the Reserve Bank. One way the Reserve Bank would issue digital cash to users is via the existing ESAS. This is explained below.[32]

31 Digital identity is defined by the New Zealand Digital Identity programme as a digital representation of your identity information, and other attributes about you, that you can use to prove who you are online to access services digitally.

32 Three may be other ways to issue digital cash that are yet to be conceived.

## Issuing digital cash on the Reserve Bank's balance sheet

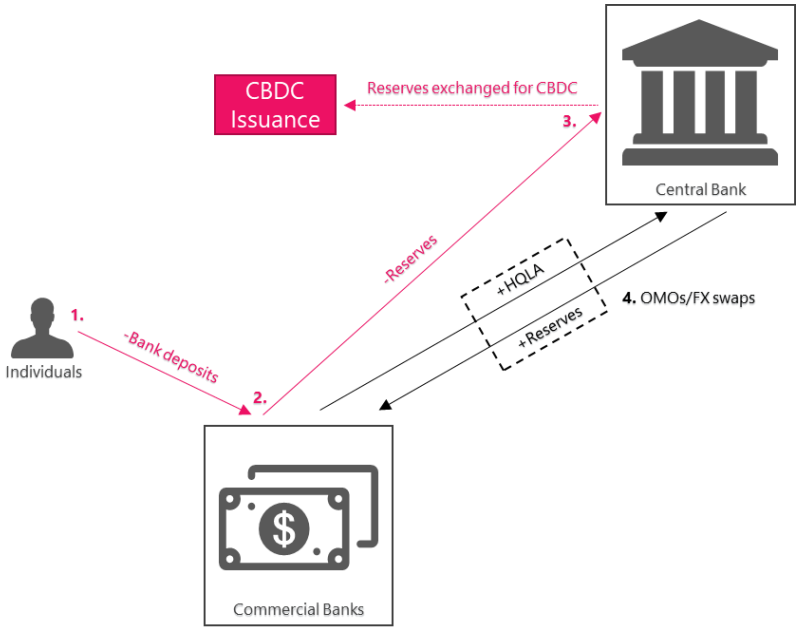
1. Individuals and businesses swap private bank deposits for digital cash (Figure 9, step 1).[33]

2. Digital cash would be treated similarly to other central bank liabilities. It would be exchangeable at par with ESAS reserves and currency in circulation (Figure 9, step 2).

3. If there is enough settlement cash, then digital cash would be swapped 1:1 with ESAS reserves (Figure 9, step 3).[34]

4. If there is not enough settlement cash, then the Reserve Bank must increase the amount of cash. To do this, the Reserve Bank can use its normal domestic liquidity tools. These tools are foreign exchange (FX) swaps and open market operations (OMOs). By increasing the amount of cash in the settlement system, the Reserve Bank can then issue more digital cash.[35]

***Figure 9: CBDC issuance with domestic liquidity management operations***




Source: Reserve Bank.

## Distribution of digital cash to the end user

The market would create services that enable people to access and spend their digital cash. They do this by getting the information about people's digital cash balances from the digital cash platform. Digital cash would never be transferred onto the balance sheet of these third parties. It would stay on the Reserve Bank's balance sheet.

33 Banks facilitate this exchange by 'purchasing' digital cash from the Reserve Bank using their ESAS reserves on behalf of their customers. The outlined mechanism is similar to when individuals and firms withdraw their deposits held at commercial banks for central bank notes (currency). We also assume that currency in circulation can be exchanged for digital cash on demand, but that this is likely to be negligible in most scenarios.

34 Ample settlement cash means there is more than enough cash to make ESAS payments and to anchor short-term market rates close to the OCR. See Callaghan et. al (2023).

35 In New Zealand, the supply of liquid assets of a suitably high collateral quality is relatively low. To avoid compromising market functioning in domestic bond markets, we would likely rely more on FX swaps to manage the level of settlement cash than OMOs. OMOs require commercial banks to source and post domestic bonds as collateral with the Reserve Bank. To inject liquidity using FX swaps, the Reserve Bank lends NZD and borrows USD for terms varying from one day up to six months. These tools are effectively short-term lending operations that are fully collateralised, and so represent little risk to the Reserve Bank. For more details on how the Reserve Bank implements monetary policy, See Callagan et al. (2023).

## Impacts on the banking sector

The level of digital cash issued would be driven by user demand. This demand for digital cash may come from deposits, physical cash or income growth. The Reserve Bank has not forecast how much digital cash people would want. But we can expect that if people want to use a lot of digital cash, then banks and other deposit takers will lose deposits. This could cause them to lose profits and liquidity.

We have developed some preliminary scenarios of digital cash supply levels. These scenarios are not what we expect will happen. In fact, we do not have any evidence to suggest that demand for digital cash will reach high levels. However, we need to test the possible impacts of high digital cash levels on commercial banks. This will help us identity when digital cash could be too high for financial stability. We can then use limits to control or slow down digital cash issuance.

Two scenarios are shown in Table 4. They make simple judgments as a starting point. The key assumptions are shown in the top four rows. The potential impact on the Reserve Bank's balance sheet and on commercial banks is shown in the bottom three rows.

1. The 'High' scenario is where $10 billion digital cash is issued. This is equal to the level of cash in circulation at the end of 2022. We swap cash and reserve balances to issue the digital cash. We assume digital cash does not earn interest and people can only hold $2000 each. In this scenario, the composition of the Reserve Bank's balance sheet changes, as more digital cash is issued and less reserve and physical cash. However, the Reserve Bank's balance sheet stays the same size. There is a minimal impact on commercial banks' deposit funding and profits.

2. The 'Extreme' scenario is where $42 billion digital cash is issued. This is equal to 20 percent of retail deposits at the end of 2022. We swap cash and reserve balances to issue the digital cash. We also need to use FX operations to increase reserve balances to issue the full amount of digital cash. We assume digital cash earns a competitive interest rate. We also assume that people can hold more than $2000 each but balances over $2000 do not earn any interest. In this scenario, as above, the composition of the Reserve Bank's balance sheet changes. This time the Reserve Bank's balance sheet also becomes longer, as we are issuing more liabilities than before. Commercial banks would face reduced deposit funding and profits. They can choose how to respond to these reductions. They can get more funding from investors, reduce lending, or increase lending rates.

***Table 4: Static managed issuance scenarios***

| Key Assumptions | High Issuance | Extreme Issuance |
|---|---|---|
| **Benchmark Level of Issuance** | Currency in circulation | 20% of retail deposits |
| **Value in NZD36** | $10 billion | $42 billion |
| **Asset Exchanged for CBDC** | Cash + Reserves | Cash + Reserves |
| **Remuneration** | None | Yes |
| Level of interest | — | Competitive |

36 As at Q3 2022.

| Key Assumptions | High Issuance | Extreme Issuance |
|---|---|---|
| **Limits** | Yes | Yes |
| Type of limit | Maximum holding limit | Tiered limit |
| Level of limit | $2000 | Not remunerated above $2000 |
| **Impact on Reserve Bank's balance sheet composition** | Changes | Changes |
| **Impact on Reserve Bank's balance sheet length** | None | Increased |
| **Impact on banks** | Minimal impact on liquidity and profitability | Liquidity and profitability falls. Deposit takers likely to mitigate these falls with increase wholesale funding, or higher lending rates |

These scenarios are a starting point for our work. We also need to consider the impact of issuing digital cash on wholesale funding rates. This is an important determinant for how banks would respond to fewer deposits. We will also consider whether we need to limit the amount of digital cash that people or businesses can hold. As well as what interest rate would be paid if any. We also need to test if there are any financial system stability impacts from issuing digital cash, including whether there are any transitional impacts on stability.

### Assumptions underpinning table 4

The two issuance levels of digital cash draw from analysis by the Bank of England and Bank of Canada.[37] We have combined elements of both approaches for our scenarios. We believe the relative size of the value of issuance between each scenario is consistent with our assumptions on the type of asset exchanged, remuneration, and limits. But they are not demand or adoption forecasts and each scenario is subject to a high degree of uncertainty.

Our assumption for the level of remuneration on the high issuance scenario is based on other central bank studies that suggest no interest should be paid.[38] The extreme issuance scenario remuneration assumption is based on the level of interest paid on commercial bank ESAS balances. Since March 2020, when the Reserve Bank moved to a floor system for monetary policy implementation, all ESAS balances have been paid the official cash rate (OCR). However, digital cash is likely to provide additional benefits as a means of payment, so paying the OCR could effectively be a subsidy and a non-market provision of services. Therefore, we could reduce the interest rate down closer to the interest paid on transactional retail deposits.

37 Bank of England, (2021), García et al. (2020).
38 Kahn et al. (2022), Bank of England (2023), Ahnert et al. (2022), and Soderberg et al. (2022).

We have determined the $2000 value of the limit by applying analysis by the ECB to New Zealand.[39] Preliminary analysis suggested that total digital euro holdings between €1-1.5 trillion would avoid negative impacts for the financial system and monetary policy. This figure is comparable to the value of currency in circulation in the Eurozone and would allow for holdings of approximately €3000-4000 digital euro per capita. Applying this to New Zealand's level of currency in circulation suggests a limit of $2000 per person.

# 8 We need your feedback

We are in stage two of a multi-year, multi-stage process of considering digital cash. We need your feedback on what we think digital cash could look like in New Zealand.

We are continuing to explore the potential benefits of digital cash for New Zealand. This includes understanding the problems digital cash is to address and what other solutions may be available. We will consult on this cost benefit analysis at a later date.

You can give us your feedback by taking our simple survey, or by responding to our questions below with a written submission. The consultation is open until 26 July 2024. Please visit https://www.rbnz.govt.nz/digitalcash to find out how to have your say. You can also post your written submission to Future of Money, Reserve Bank of New Zealand, #2 the Terrace, Wellington 6012.

## 8.1 Submission questions

### Publication of submissions

All information in submissions will be made public unless you indicate that you would like all or part of your submission to remain confidential. Respondents who would like part of their submissions to remain confidential should provide both confidential and public versions of their submissions. Apart from redactions of the information to be withheld (i.e., blacking out of text), the two versions should be identical. Respondents should ensure that redacted information is not able to be recovered electronically from their documents (the redacted versions may be published as received).

Respondents who request that all or part of their submissions be treated as confidential should provide reasons why this information should be withheld if requests are made for it under the Official Information Act 1982 (OIA). These reasons should refer to the grounds for withholding information under the OIA. If an OIA request for redacted information is made, the Reserve Bank will make its own assessment of what must be released, considering the respondent's views.

The Reserve Bank may also publish an anonymised summary of the submissions received in respect of this consultation.

### Consultation questions

1. Do you have any feedback on the objectives for digital cash to:
    i. ensure that central bank money is available to New Zealanders and allow it to be used digitally?

39 Bindseil (2020).

ii. contribute to the innovation, efficiency and resilience of New Zealand's money and payments landscape?

2. Do you have any feedback on the digital cash principles: Uniform, Universal, Private, Innovative, Reliable, and Orderly?

3. What are your biggest concerns with digital cash? What design changes, if any, could address your concerns?

### Benefits of digital cash

4. Do you think digital cash can enable long term innovation for New Zealanders? What innovative features should digital cash or its platform have?

5. Do you think digital cash can improve the reliability of payments in New Zealand? What reliability features should digital cash or its platform have?

6. How can digital cash support digital financial inclusion? What design features (technical, governance, or standards) would be required to support digital financial inclusion?

7. What problem(s) could digital cash help you or your organisation address and what benefit(s) could it bring?

## Strategic design

Future stages of work will continue to refine the design details of digital cash and its ecosystem, including governance arrangements. To assist us we would like feedback from the financial sector and possible partners in the digital cash ecosystem.

8. Do you have feedback on the digital cash design models and the Reserve Bank's preferred approach set out in section 6?

9. What role might your firm or organisation take in the digital cash ecosystem, and what support would you require from the Reserve Bank?

    i. What products and services would you build off the options? What design functionality would you need to support you?

    ii. What core functionality should be provided by the digital cash platform and what should be provided by the market?

    iii. What key governance measures would you expect the Reserve Bank to provide in the digital cash ecosystem?

10. Third party intermediaries will own the customer relationship including managing onboarding and AML/CFT requirements. What support or enabling functionality would you require as a potential third party?

## Managed issuance

Future stages of work will explore the potential impacts of digital cash on the financial system and assess the benefits, costs, and risks. To assist us, we would like feedback on the following:

11. Do you expect interest to be paid on digital cash holdings?

12. Do you think there should be holding limits for digital cash or any other controls on issuance?

# References

## Supporting consultation publications

To support this consultation the following consultation notes and reports are available here.

- Reserve Bank (2024a) 'Designing a digital cash ecosystem', *Digital Cash Consultation Note*, No 1.
- Reserve Bank (2024b) 'Innovation and reliability opportunities for digital cash', *Digital Cash Consultation Note*, No 2.
- Reserve Bank (2024c)' Inclusion opportunities for digital cash', *Digital Cash Consultation Note*, No 3.
- Reserve Bank (2024d) 'Designing privacy into digital cash', *Digital Cash Consultation Note*, No 4.
- Accenture and the Reserve Bank of New Zealand (2024) 'Central Bank Digital Currency', Strategic Insights Dossier, April.
- GravitasOPG and One Picture (2023) 'User needs for money management and payments', Qualitative research report, April.
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