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Dear Sir or Madam,

Ripple welcomes the opportunity to comment on the Bank of Thailand Discussion Paper: The Way Forward for Retail Central Bank Digital Currency in Thailand ("the Discussion Paper"), published on April 2, 2021. Ripple would also like to thank the authors and contributors of the Discussion Paper for making public the in-depth research and analysis undertaken, and for consulting on the way forward for a retail Central Bank Digital Currency ("CBDC") in Thailand. The Bank of Thailand is a leader in the CBDC space and has already shown the importance of public-private partnerships, and Ripple welcomes the opportunity to assist the Bank of Thailand in the design and development of a retail CBDC.

With over approximately 300 customers as of the date of this letter, Ripple's software products allow financial institutions to send money globally, on a real-time basis, at a fraction of the cost of traditional services available to market participants. Using blockchain technology, Ripple allows financial institutions to process payments instantly, reliably, cost-effectively, and with end-to-end visibility anywhere in the world.

Ripple's aim is not to replace fiat currencies, but rather to enable a faster, less expensive, and more transparent method of making cross-border payments that is in the public's best interest. Unlike the large majority of companies seeking to leverage digital assets, Ripple's customers and partners are regulated financial institutions, both banks and

<sup>&</sup>lt;sup>1</sup> See <a href="https://www.bot.or.th/Thai/DigitalCurrency/Documents/BOT\_RetailCBDCPaper.pdf">https://www.bot.or.th/Thai/DigitalCurrency/Documents/BOT\_RetailCBDCPaper.pdf</a>, Bank of Thailand Discussion Paper: The Way Forward for Retail Central Bank Digital Currency in Thailand.

payment service providers, who operate within the contours of the existing financial system.<sup>2</sup>

Although this Discussion Paper is focused on the use-case for a retail CBDC, the Bank of Thailand also recognizes that a CBDC has the potential to serve as a building block for better cross-border payments.<sup>3</sup> Ripple believes that interoperability - achieved through alignment of national payment protocols and adoption of international standard protocols - will ultimately be core to any successful retail CBDC design.

Ripple itself applies protocols to drive the efficient globalization of value through multiple initiatives with financial services and open-source communities. RippleNet, our enterprise software solution which is powered by a standardized application programming interface ("API") and built on the market-leading and open standard Interledger Protocol, enables financial institutions to facilitate faster and less costly cross-border payments. RippleNet demonstrates that deep interoperability between commercial financial institutions can make payments truly efficient, particularly in eliminating the uncertainty and risk historically involved in moving money across borders using interbank messaging alone.

In addition, Ripple offers these entities an On-Demand Liquidity capability which leverages the digital asset XRP as a bridge between fiat currencies, further reducing the friction and costs for commercial financial institutions to transact across multiple global markets. XRP is the digital asset that is native to the XRP Ledger, a distributed ledger platform.

Although Ripple utilizes XRP and the XRP Ledger in its product offerings, XRP is independent of Ripple. The XRP Ledger is decentralized, open-source, and based on cryptography. Ripple leverages XRP for use in its product suite because of XRP's suitability for cross-border payments. Key characteristics of XRP include speed, scalability, energy efficiency, and cost.

Protocols used by global, cross-border payment networks and decentralized tools that support them should be considered and supported in this new age of domestic networks, including with respect to the development of retail CBDCs. Embracing the capabilities of these global networks, and better enabling domestic institutions to connect their individual capabilities with other systems and markets, will enable optimized outcomes for their respective domestic needs as well as fulfill the potential that globalization of value holds.

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<sup>&</sup>lt;sup>2</sup> The terms digital asset, virtual currency, cryptocurrency and others are used interchangeably in the marketplace. For purposes of this comment letter, we use the term "digital asset."

<sup>&</sup>lt;sup>3</sup> See Discussion Paper, page 10.

On March 3, 2021, Ripple announced a pilot of a private version of the public, open-source XRP Ledger that provides Central Banks a secure, controlled and flexible solution for the issuance and management of digital currencies ("the CBDC Private Ledger").<sup>4</sup> The CBDC Private Ledger is based on the same blockchain technology that powers the XRP Ledger, which has supported the management of billions of dollars of value for over 8 years, without any significant security or operational issues. This also means that the CBDC Private Ledger is built for payments and designed for issuing currencies, with over 5,400 currencies issued on the XRP Ledger over the past 8 years, including XRP - which can be leveraged as a neutral bridge asset for frictionless value movement between CBDCs and other currencies.

Therefore, moving money on the CBDC Private Ledger will be cost-effective, reliable and close to instantaneous. Transactions can also happen at volumes required by Central Banks. The CBDC Private Ledger will handle thousands of transactions per second initially, with the potential to scale over time by using Federated Sidechains or via the Interledger Protocol.

Transactions on the CBDC Private Ledger are verified by the same consensus protocol used by the XRP Ledger, which is far less energy intensive, and therefore less expensive and more efficient than public blockchains that leverage proof-of-work. In addition to leveraging the XRP Ledger technology, the CBDC Private Ledger is also supported by RippleNet technologies and the Interledger suite of protocols, to enable ultra-high throughput use-cases such as micropayments.

The CBDC Private Ledger meets even the highest of security standards for Central Banks, with each having complete sovereignty and ability to customize based on their own unique privacy and policy requirements. While the CBDC Private Ledger has been designed on the basis of an open-source solution - the XRP Ledger - Ripple has adapted it for use so that Central Banks such as the Bank of Thailand can run a private network, allowing complete control over the system.

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<sup>&</sup>lt;sup>4</sup> See <a href="https://ripple.com/lp/cbdc-whitepaper">https://ripple.com/lp/cbdc-whitepaper</a>, Ripple Report: The Future of CBDCs.

With this overview, Ripple respectfully submits the following responses to the questions set forth in the Discussion Paper in the attached Appendix.

Ripple appreciates the opportunity to comment on the Discussion Paper as the Bank of Thailand considers the design of a retail CBDC. Should you wish to discuss any of the issues raised in this letter further, please do not hesitate to contact Rahul Advani (Policy Director, APAC) at <a href="mailto:radvani@ripple.com">radvani@ripple.com</a>.

Sincerely,		
Ripple Labs, Inc.		

#### **APPENDIX**

### Section A: Cost-Benefit Analysis of Opportunities, Risks and Challenges

1. What are some other costs or benefits of CBDC worth noting?

Ripple appreciates the extensive cost-benefit analysis of all opportunities, risks, and challenges undertaken by Bank of Thailand in Appendix 2 of the Discussion Paper.<sup>5</sup> Ripple would like to note some additional benefits and policy considerations for Bank of Thailand to consider in the design of a retail CBDC.

a. Cross-border remittances: We note that the Bank of Thailand has indicated that enhancing efficiencies in cross-border remittances is a secondary opportunity.<sup>6</sup> Such categorization may be due to the fact that, typically, Central Banks such as Bank of Thailand are not part of cross-border payment flows and may not have the infrastructure to deal with related functions like transaction monitoring and Know Your Customer and Anti-Money Laundering checks. Having its retail CBDC circulating in foreign jurisdictions could also impact Bank of Thailand's monetary policy and liquidity management, as has been highlighted in the Discussion Paper.<sup>7</sup> Bank of Thailand has also noted some alternative policy solutions that are available to address cross-border remittances.<sup>8</sup>

We believe, however, there is an important role for Central Banks to play in the cross-border remittance space. Overseas workers are often saddled with high transaction fees when sending money home to their families. Additionally, these remittance corridors are sometimes too small to warrant adequate attention from major financial institutions, and therefore cannot reach the economies of scale needed in order to reduce costs. A CBDC used to facilitate cross-border remittances will be a service to overseas Thai workers and will help support the country's economic growth.

Additionally, consumers and businesses in Thailand will inevitably have a need to transact with foreign suppliers and vendors. CBDCs that are interoperable with each other will give those countries a competitive advantage. Interoperable retail CBDCs also have the potential to help create linkages and cooperation between

<sup>&</sup>lt;sup>5</sup> See Discussion Paper, page 37.

<sup>&</sup>lt;sup>6</sup> See Discussion Paper, page 39.

<sup>&</sup>lt;sup>7</sup> See Discussion Paper, page 38.

<sup>&</sup>lt;sup>8</sup> See Discussion Paper, page 39.

regional economies and trading blocs such as the Association of Southeast Asian Nations, of which Thailand is a member.

Finally, we also think an effective retail CBDC should allow for the processing of micropayments (i.e., payments made for very small amounts - under \$5), including cross-border micropayments. Currently, the transaction costs associated with fiat micropayments are too high to support their execution. It is also important to note that since a retail CBDC is expected to substantially lower these frictional costs, the number of transactions (whether micropayments or not) is likely to be much higher than observed today, leading to greater cross-border demand.

As we can see from Figure 1, overseas Thai workers remitted approximately 192 billion Thai Baht into Thailand in 2019, which represents a 34% increase over the 144 billion Thai Baht remitted inwards in 2018. Even so, international remittances to Thailand are costly, full of friction, and slow. Data from the World Bank indicates that the average transaction cost of sending remittances to Thailand was around 7.71% in 2020. Enhancing efficiencies in such cross-border remittances will be a key benefit of a retail CBDC.

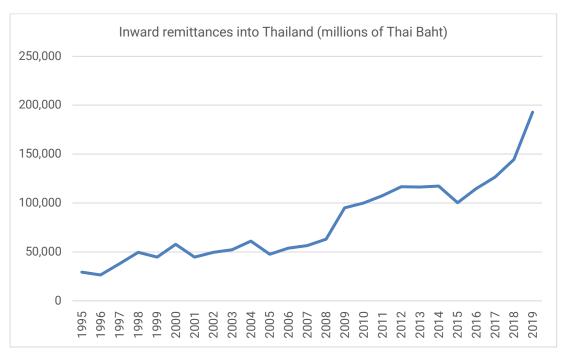


Figure 1: Inward remittances into Thailand (Millions of Thai Baht), 1995-2019<sup>10</sup>

<sup>&</sup>lt;sup>9</sup> See <a href="https://data.worldbank.org/indicator/SI.RMT.COST.IB.ZS?locations=TH">https://data.worldbank.org/indicator/SI.RMT.COST.IB.ZS?locations=TH</a>, Average transaction cost of sending remittances to a specific country (%) - Thailand.

<sup>&</sup>lt;sup>10</sup> Data sourced from Bank of Thailand Employment Indicators, 1995-2019. See <a href="https://www.bot.or.th/App/BTWS\_STAT/statistics/ReportPage.aspx?reportID=111&language=eng.">https://www.bot.or.th/App/BTWS\_STAT/statistics/ReportPage.aspx?reportID=111&language=eng.</a>

b. Digital wallets: We also note that the Bank of Thailand has indicated that enhancing financial inclusion is a secondary opportunity.<sup>11</sup> It is worth noting here that one of the bigger drivers of financial inclusion over the past decade has been the rise of financial services from outside the banking sector, such as remittances providers and digital wallets. These services are pioneering new offerings and alternative experiences for traditional banking users.

The issuance of a retail CBDC could occur in tandem with the creation of associated digital wallets that give consumers ownership to the digital currency and allow for a faster and more efficient method of distribution of money by the Thai government to its citizens. Digital wallets that enable payments, whether made domestically or cross-border, without requiring a bank account could succeed in promoting financial inclusion for the unbanked and underbanked population, which may not be adequately served by the traditional banking system.

While digital wallets could be used to enable peer-to-peer, or wallet-to-wallet payments, an infrastructure will need to be put in place to allow for the seamless transition from the existing card-based infrastructure and must provide for, among other things, consumer protection, fraud prevention, and authentication and authorization. Moreover, because there are likely to be many different wallets to choose from, it is imperative that interoperability be taken into account to enable a seamless payment experience (for example, by allowing for consistent and effective authentication and authorization), as we discuss in further detail in Section B, Question 1 below.

- c. Tokenization of assets: While not addressed directly in the discussion paper, Ripple would also like to highlight the ability for a retail CBDC to extend the benefits of tokenization to the public. Building on the work that the Bank of Thailand has done on wholesale CBDCs, the tokenization of assets can be extended through a retail CBDC by allowing the private sector to develop on the ledger established for a retail CBDC, to create new opportunities for tokenization. Examples include protecting property rights for tangible property (such as property, art, and collectibles) as well as intangible assets (digital rights) via non-fungible tokens.
- d. Optimizing supply chain workflows: Finally, the wholesale and retail CBDC workflows being explored by the Bank of Thailand can also support efficiencies in supply chains by being used to escrow funds and pay invoices. Distributed exchanges, such that are built into the CBDC Private Ledger, can ease friction in

<sup>&</sup>lt;sup>11</sup> See Discussion Paper, page 41.

cross-border commercial payments by allowing the payor to choose the currencies they have, and the payee to choose the currencies they want to hold.

### 2. How can we harness the benefits of or address the risks arising from issuing CBDC?

Ripple has no comments on this question.

# 3. Where and how can public-private cooperation have the most impact in harnessing the benefits of or addressing the risks arising from issuing CBDC?

Ripple broadly agrees that creation of a two-tiered public-private payments platform approach proposed in the Discussion Paper,<sup>12</sup> in which the Bank of Thailand issues the CBDC (Tier 1) while private sector firms distribute the CBDC (Tier 2), could prove an effective model. Ultimately, the more open and extensible the payments platform, the more utility it will deliver. We believe that broad utility - and interoperability - will define success for CBDCs.

Private sector firms like Ripple are well positioned to innovate to solve the interoperability challenges that development of such a platform could ultimately create. Ripple plays an essential role in the XRP Ledger ecosystem by bringing together investment from many different entities (such as private companies, governments, and academia) to provide an open platform approach in which all entities have an equal opportunity to build value-adding services without friction from intermediaries.

We thus support the creation of a public-private payments platform approach proposed by the Bank of Thailand that leverages the innovation that companies like Ripple have to offer. Such private sector innovation will also help boost adoption of a retail CBDC, mitigating any concerns around slow adoption.

#### 4. How and in what ways can CBDC and other forms of digital currencies co-exist?

A neutral bridge asset can support healthy, alternative liquidity markets that will allow for frictionless and cost-effective value movement between various CBDCs in realtime. It would also enable the exchange of less liquid CBDC pairs and increase global competition by lowering entry barriers to new and smaller market participants. We

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<sup>&</sup>lt;sup>12</sup> See Discussion Paper, Page 28.

have explained the role of a neutral bridge asset and XRP as a neutral bridge currency in more detail in Section B, Question 2 below.

#### **Section B: CBDC Design Considerations**

1. What other factors may need to be considered in our approach for CBDC design considerations?

A retail CBDC is only useful if there is an infrastructure in place to enable its spending easily and efficiently. Therefore, a retail CBDC is heavily dependent on infrastructure usable by consumers and merchants.

- a. Payment Acceptance Innovations: At the most basic level, a CBDC wallet needs to be usable with ATMs to allow the digital CBDC to be exchangeable with physical central bank money, cash. CBDC wallets can also be used easily for peer-to-peer, or wallet-to-wallet payments, but an infrastructure needs to be in place to, in effect, replace the existing cards infrastructure for online, phone and POS payments. This infrastructure would need to encompass consumer protection rules, fraud prevention, refunds and returns, addressability, authentication and authorization, as well as hardware and software to accept CBDC payments from consumers. Through Open Banking, innovation is already happening in these areas, with third parties using banking APIs to innovate payments and financial applications, embedding the APIs in their own services.
- b. Capabilities for Third Party Innovations: Additionally, for a CBDC to be successful it would need to be usable for third parties, and their developers, to build this infrastructure and create innovative applications with CBDC capabilities embedded.
- c. Digital Identity Innovations: Open Banking has highlighted the complexity of strong customer authentication in digital payments, and its adverse impact on frictionless customer experiences, even risking the actual adoption and usability of Open Banking. A strong customer authentication system is therefore important to a successful CBDC, requiring an effective identity system to enable it.

Identity is needed in payments for authentication (is the person or device making this payment the legitimate owner of the funds paid?), for authorization (has the legitimate owner of the funds authorized the payment?) and for addressability (is the destination of the payment reachable and identifiable and is it the actual one intended?).

We expect that there could be many different wallets and wallet providers to choose from for CBDC users (e.g., consumers, merchants, businesses, Payment Interface Providers). It is therefore important that there is commonality or interoperability between different wallets to enable consistent, effective and seamless authentication, authorization and addressability in CBDC payments.

While digital identity use cases are much wider than those needed for payments, a CBDC would therefore benefit from a digital identity solution that allows wallets from multiple providers to enable authentication, authorization and payment addressability. In general, it would be good practice to use market solutions and standards where relevant, and design the CBDC to work with identity solutions, especially for scenarios where transactions are shared with other networks.

As an example of a relevant market solution, Ripple through its Ripple X initiative is participating with a coalition of industry participants in the launch of a payments addressability solution, which allows payments to be exchanged between counterparties using any payment system. This solution can work with digital identity solutions and can provide addressability for CBDC wallets, enabling a secure, safe and frictionless customer experience.

d. Expanding the Scope of Intermediaries for Distribution: While we understand from the Discussion Paper that the Bank of Thailand intends to leverage financial intermediaries for distribution of the CBDC, 14 it is also important to ensure that the design and the distribution model of the CBDC supports financial inclusion. This will mean including non-traditional participants as intermediaries in the CBDC distribution system - such as telecommunications companies, payment service providers, digital banks, and CBDC wallets - who will have the ability to serve a segment of the population that may be underserved by traditional financial intermediaries. Such intermediaries will require access to Central Bank accounts, and blockchain and distributed ledger technologies ("DLTs") that have proven themselves in an open environment will facilitate the inclusion of such new participants in the Bank of Thailand's monetary systems, while providing a level of security and mitigating any risk to the Bank of Thailand.

<sup>&</sup>lt;sup>13</sup> See https://ripplex.io/docs/use-cases/#payments, Use Cases in Payments.

<sup>&</sup>lt;sup>14</sup> See Discussion Paper, Page 28.

## 2. Are there any specific preferences in CBDC design you would like to see as a user or intermediary?

While interoperability will support the direct exchange of a CBDC in domestic transactions, many of the same, old issues with cross-border transactions will remain. In particular, supporting immediate real-time foreign exchanges, as opposed to the current 3–5-day process, will likely still require the need for prefunded currency accounts.

Bank of Thailand, much like any commercial bank or global business, will want to avoid the increased costs and risks associated with this liquidity issue, and would likely also welcome the ability to free up capital that could be generating value elsewhere and skews the financial system in favor of the most liquid currencies.

A neutral bridge asset can support healthy, alternative liquidity markets that will allow for frictionless and cost-effective value movement between various CBDCs in realtime. It would also enable the exchange of less liquid CBDC pairs and increase global competition by lowering entry barriers to new and smaller market participants.

To enable a truly efficient global market, a bridge currency must be specifically optimized for payments and support the same speed, scalability, low cost and security that CBDCs will provide. One example of a neutral bridge is the digital asset XRP, which can be used to bridge two different currencies quickly and efficiently. By underpinning an effective alternative liquidity market, neutral bridge currencies are the final piece of the interoperability puzzle that will drive the success of CBDCs as a global tool for exchanging value.

Therefore, we request the Bank of Thailand consider the role a neutral bridge asset such as XRP can play in the design of a retail CBDC.

## 3. What other technology options should we consider for the CBDC system? What are the advantages or disadvantages involved?

Whether to choose a centralized core ledger or a consensus-driven distributed approach depends on the Bank of Thailand's objectives and philosophy for its control of a CBDC and how it is used. With a centralized core ledger, the Bank of Thailand has absolute control, while with a decentralized one, it can set the rules absolutely at the start, but can rely on others to enforce the rules through consensus. Considerations for the Bank of Thailand include:

- **Transaction validation** does the Bank of Thailand wish to validate every transaction centrally?
- Network integrity how will the CBDC solve the double spend challenge? With
  a central ledger, it can do so by validating every transaction, no consensus
  needed. With a decentralized ledger, it will require a decentralized consensus
  mechanism, where multiple validators validate each transaction.
- Censorship what actual and perceived censorship control over the ledger does Bank of Thailand wish to exercise? With a central ledger, Bank of Thailand can prohibit or change any CBDC transaction or user of CBDC it wishes. Even with privacy and other legal and technical safeguards, this comes with "Big Brother" risk. This risk still exists if the Bank of Thailand runs decentralized consensus on a permissioned distributed ledger network where it can change the rules with the same control as with a central ledger. However, the Bank of Thailand could also consider a permissionless distributed ledger network where the rules are very difficult to change - this protects the network from outside influence in the future, and it would preserve the rules for the CBDC network with certainty for years to come. The Bank of Thailand takes its independence seriously, and this would ensure its CBDC network remains independent and resistant to any future external pressures to make changes that stray away from the original purpose and objectives of the CBDC. Rules can be added or mandated for smart contracts using the CBDC, so that the Bank of Thailand would still have tools to keep control of the CBDC network.
- Regulatory compliance consensus can be extended beyond transaction validation, into verifying transactions for compliance checks. The power of the network in reaching consensus on whether a transaction meets AML, sanctions, CTF, KYC, UBO and other rules, including fraud, could be much more powerful than individual nodes acting on their own information.
- **Revocability** what are the finality/revocability rules for a transaction and does the Bank require a role in applying or monitoring them?

The CBDC Private Ledger consists of three main components:

- CBDC Private Ledger software, which as previously mentioned is a derivative of the XRP Ledger software with features that support CBDC functionality;
- **CBDC Private Ledger** itself, which consists of a private network (or multiple networks) of peer-to-peer servers running CBDC Private Ledger software; and
- **The CBDC** itself, digital assets on the CBDC Private Ledger that represent a fiat currency (as liability of the Central Bank).

The CBDC Private Ledger will also leverage Federated Sidechains to allow for scalability, and CBDC management tools to support key management and custody and the technical link between cryptographic signatures and traditional username and password systems.

For context and as highlighted previously, Ripple uses both the public XRP Ledger for cross-border payments using XRP as a bridge currency, and our own proprietary distributed ledger peer-to-peer software which allows cross-border processing in fiat currencies only, dependent on fiat nostro accounts.

The XRP Ledger uses a Byzantine agreement protocol for consensus where network validators agree to participate in the consensus process by joining a group of other validators in a Unique Node List ("UNL"), and network users select the UNL they trust. Bad actors are kept out, as within a UNL their actions would be spotted by good actors very quickly and disregarded; while a UNL full of bad actors would similarly become apparent to other UNLs and be barred from the consensus process. This has worked in practice successfully for eight years. It is also a very quick process, with a transaction time of around between 3-5 seconds, and current capacity of thousands of transactions per second without requiring the substantial consumption of electricity required by other protocols such as Bitcoin or Ethereum. 15

In our peer-to-peer fiat software, consensus is required only between the sending and receiving institution (and with other institutions if one is used in routing the payment). When each institution is satisfied that its data validation, sanctions and other checks are OK, a validator confirms the consensus and initiates the ledger entries - this process is atomic, i.e., either both ledgers are updated or neither is updated, ensuring their mutual integrity.

If the Bank of Thailand chooses a decentralized approach, either, or both (in a hybrid) of these consensus mechanisms could be used for the Bank of Thailand CBDC. If the Bank of Thailand's intent is to validate every transaction, but with the ledger distributed among participants (Payment Interface Providers), then a peer-to-peer consensus mechanism may be optimal. If the Bank of Thailand's intent is to set the CBDC framework and let the network look after itself, then a Byzantine agreement consensus may be appropriate. In a hybrid of the two, the Bank of Thailand could validate transactions it deems important (for example, those above a certain value, or between certain counterparties, or of a certain type or risk) while leaving the rest to be validated by the network as a whole.

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<sup>&</sup>lt;sup>15</sup> See <a href="https://xrpscan.com/metrics">https://xrpscan.com/metrics</a> for detailed statistics.

Bank of Thailand can also leverage Federated Sidechains. In a blog post published on June 7, 2021,<sup>16</sup> Ripple presented plans to introduce Federated Sidechains on the XRP Ledger. Introducing Federated Sidechains for the XRP Ledger will enable developers to implement new features - such as native smart contracts that interoperate seamlessly with XRP and the XRP Ledger - while also allowing the XRP Ledger to maintain its existing features.

The advantages of Federated Sidechains for CBDCs are that it will allow for experimentation and specialization. For example, the Bank of Thailand can run multiple Federated Sidechains, some of which may be more private while others are more open. This essentially means that each Federated sidechain would function as its own blockchain, and the CBDC could be moved from one chain to another.

4. Are there any specific recommendations on a governance model, standards and regulations we should take into consideration?

Ripple has no comments on this question.

#### Section C: Capacities and Preparation for Retail CBDC Issuance

1. How do you view the general Thai public's readiness in adopting a retail CBDC at a national scale?

Ripple has no comments on this question.

2. In what specific ways should the BOT engage with private sector to collaborate on building capacity for CBDC?

We commend the Bank of Thailand for the pro-active engagement with the private sector in designing and implementing a retail CBDC. We recommend engaging and partnering with industry leaders early in the decision-making process in order to gain knowledge of the current and future technology landscapes, and the applicability to a retail CBDC.

It is important to note that private innovation has been a key driver for the development of CBDCs globally, and Ripple is on the forefront of new innovations. We

<sup>&</sup>lt;sup>16</sup> See <a href="https://blog.ripplex.io/a-vision-for-federated-sidechains-xrp-ledger/">https://blog.ripplex.io/a-vision-for-federated-sidechains-xrp-ledger/</a>, A Vision for Federated Sidechains on the XRP Ledger.

can help the Bank of Thailand in preparing for the future of digital currencies and global payments. Working with a private company like Ripple can help build capacity and leverage the expertise we have built in DLT, operating a large-scale payments network for cross-border payments, and in developing and implementing digital assets and the CBDC Private Ledger.

Ripple would welcome the opportunity to partner with the Bank of Thailand to help build such capacity onshore.

## 3. What other necessary preparation requirements should be addressed in terms of capacity building?

In addition to partnering with the private sector, we would also like to highlight the importance of partnering with local and regional academic institutions. As has been the case with other groundbreaking technologies, academic institutions unlock the real power of DLT through curriculum, research, technical innovation, and knowledge sharing.

Ripple's University Blockchain Research Initiative ("UBRI") supports universities around the world to advance blockchain education and real-world solutions in digital payments and beyond. Partnering with over 35 leading global universities, the UBRI program supports universities on research, new curriculum development, and technical projects. Each participating university shapes its own topics and areas of focus, and Ripple provides students and faculty with strategic guidance, technical resources, and funding where appropriate.<sup>17</sup> Ripple would welcome further engagement with the Bank of Thailand to identify opportunities to build capacity at local academic institutions to develop talent and accelerate research locally.

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<sup>&</sup>lt;sup>17</sup> See <a href="https://ubri.ripple.com/faq/">https://ubri.ripple.com/faq/</a>, UBRI FAQs.