FedFin Client Report

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Fed Studies: CBDC Could Beat RTP; Use of DLT Adds Critical Functionality, Ease of Introduction

Client Report: **CBDC3**

Executive Summary

As noted late last week, FRB Gov. Brainard announced that the Federal Reserve has begun a cautious review of central bank digital currency (CBDC) with an eye on its role in relation to FedNow (see FSM Report **PAYMENT17**) and protecting the dollar's reserve-currency status. This report assesses two papers laying out initial Fed analyses finding considerable benefit to a properly-configured CBDC and fewer technology obstacles to establishing one than anticipated in FRB Chairman Powell's letter last year to Congress. However, neither study assesses policy questions such as the extent to which CBDC is consistent with current law, personal-privacy implications, the future of financial intermediation, monetary-policy impact, or the role of nonbanks. The first study, released in concert with Gov. Brainard's speech, compares CBDC to existing payment options, concluding that CBDC with cash equivalent capability is preferable to RTP judged across a spectrum of payment- and social-welfare criteria. The second paper discloses a Fed 2019 experiment with CBDC cheerfully dubbed "FooWire." Despite the tentative pace at which the FRB plans to study CBDC with MIT, this study found that it would be possible quickly to build out CBDC using its selected DLT platform with capabilities above the reach of current payment systems and FedNow. Indeed, the paper concludes that private payment systems using its DLT model could quickly provide real-time payments, increasing the challenges to FedNow highlighted in our analysis last week. However, the experimental findings also note the need for additional work on security as well as on various systems and policy trade-offs.

Analysis

1. CBDC Benefits

This Fed note looks at the benefits – but not risks – of a CBDC integrated with the current payment system, concluding that CBDC advocates expect a raft of benefits that are unlikely all to be realized. It thus seeks to determine which CBDC benefits are most likely in comparison to the attributes of existing payment services (cash and real-time payment, RTP, with the paper not differentiating between private RTP and FedNow). Looking at issues not driven by policy (e.g., privacy) or technological factors, key points include:

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- Accessibility: Currently, cash is widely accepted but RTP is limited to persons with bank accounts; however, RTP expanded to prepaid-card and mobile-phone users would reach 97 percent of the population. A CBDC using bank accounts running over a mobile network without requiring smart-phone use would reach 98 percent.
- Anonymity: A CBDC would almost certainly need to comply with AML and similar rules and thus not provide greater anonymity than RTP.
- Bearer Instruments: CBDCs could be designed as bearer instruments either by ownership of a digital "object" or private key. If these instruments have offline transaction capability, then they are functionally equivalent to cash.
- Independence: This means simple intermediation chains giving the bearer independence to use the money instrument. RTP+ could include nonfinancial institutions and CBDC needs some form of intermediation, card, mobile device, mobile-service provider, or digital-wallet provider.
- Efficiency: FRB cash-related costs are approximately $1 billion; payment system costs are approximately $150 million. As a result, CBDC is likely to be cost-efficient for the Fed, but this will depend on its design. For example, CBDC in which the Fed directly services businesses and households could prove quite costly, especially at the start. However, the social-welfare benefits of CBDC in terms of systemic operational efficiency could be significant. These include saving businesses the cost of handling cash, although consumers prefer cash.
- Programmability: RTP currently lacks the programmability needed for the ancillary services offered by some DLT systems. These could be readily achieved via APIs. RTP+ systems could also custom-build APIs. This discussion does not contrast these features with CBDC.
- Service Availability: RTP is 24x7x365 as is CBDC, which could also be still more available with offline capabilities.

Based on these factors, the paper generally concludes that CBDC will not be better than cash plus RTP but has significant added benefits over RTP on its own. CBDC with cash-equivalent capability would meet or exceed RTP benefits, but an account-based CBDC without cash-equivalence does less well. The paper also considers hybrid CBDC which operates through intermediaries such as banks; this is deemed preferable to RTP.

2. FooWire Project Analysis

FooWire was a Fed staff experiment constructing CBDC using a popular, permission-based DLT platform with the potential to reduce an array of operational and financial inefficiencies in the current payment system as well as enhance network resilience. DLT is also said to be well suited to the Fed's decentralized approach to the payment system, by which the study authors presumably mean the role of Reserve Banks. Interestingly, the experimenters build in smart contracts so that the CBDC proxy could not only exchange funds, but also prohibit overdrafts and limit transaction value.

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Key conclusions from the experiment are:

- Although the study did not fully test or optimize the DLT platform it selected, it nonetheless concludes that DLT is a viable technology for certain payment uses. The paper does not say what these are, but suggests settlement may be DLT's best use at least as constructed for this experiment.
- A DLT-based CBDC could be quickly launched. This speed may also enable private payment systems, although the FooWire paper does not provide a discussion of what these might be and how they could affect CBDC.
- Writing smart contracts into the DLT system was "relatively easy." An array of other platform capabilities permit additional payment options that require additional analysis to identify potential trade-offs. For example, entities within the DLT system could keep their own transactions private at cost to computing resources and network complexity.

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