

Question: 04. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?

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Question

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How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum-employment and price-stability goals?

Answer

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Overview

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In order to answer this question, it is important to have some definitions that relate to Federal Reserve's ability to effectively implement monetary policy. Based on these definitions explore "*What is the Federal Reserves Monetary Policy*", and finally focus on non-Cash payments and how they relate to CBDC.

Definitions

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The Federal Reserve has defined the following terms:¹⁾

Table 1: Definition of some key terms by the U.S. Federal Reserve.

Discount Rate	The Discount Rate is the interest rate charged by Federal Reserve Banks to depository institutions on short-term loans.
Federal Open Market Committee (FOMC)	The Federal Open Market Committee (FOMC) formulates the nation's Monetary Policy . The voting members of the FOMC consist of the seven members of the Board of Governors (BOG), the president of the Federal Reserve Bank of New York, and presidents of four other Reserve Banks who serve on a one-year rotating basis. All Reserve Bank presidents participate in FOMC policy discussions whether or not they are voting members. The chairman of the Board of Governors chairs the FOMC meeting. The FOMC typically meets eight times a year in Washington, D.C. At each meeting, the committee discusses the outlook for the U.S. economy and monetary policy options.
Federal Reserve Funds	Federal Reserve Funds are the overnight lending rate at which banks borrow reserves from each other. The Federal Funds Rate is sensitive to changes in the demand for and supply of reserves in the banking system and thus provides a good indication of the availability of credit in the economy.
Monetary Policy Instruments	The Federal Reserve's three Monetary Policy Instruments are Open Market Operations , the Discount Rate , and Reserve Requirements .
Inflation	Inflation is a sustained increase in the general level of prices, which is equivalent to a decline in the value or purchasing power of money. If the supply of money and credit increases too rapidly over time, the result could be inflation.
Monetary Policy	Monetary Policy refers to what the Federal Reserve, the nation's central bank, does to influence the amount of money and credit in the U.S. economy. What happens to money and credit affects interest rates (the cost of credit) and the performance of the U.S. economy.
Open Market	Open Market means that the Fed doesn't decide on its own which securities dealers it will do business with on a particular day. Rather, the choice emerges from an "open market" in which the various securities dealers that the Fed does business with – the primary dealers – compete on the basis of price.
Open Market Operations	Open Market Operations involves the buying and selling of government securities. The term Open Market means that the Fed doesn't decide on its own which securities dealers it will do business with on a particular day. Rather, the choice emerges from an "open market" in which the various securities dealers the Fed does business with – the primary dealers – compete on the basis of price. Open Market Operations are flexible, and thus, the most frequently used tool of monetary policy.
Reserve Balances	Reserve Balances with Federal Reserve Banks is the amount of money that depository institutions maintain in their accounts at their regional Federal Reserve Banks.

What is the Federal Reserves Monetary Policy

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Figure 1 illustrates the transmission of monetary policy. In the broadest terms, monetary policy works by spurring or restraining the growth of overall demand for goods and services in the economy. When overall demand slows relative to the economy's capacity to produce goods and services, unemployment tends to rise and inflation tends to decline. The FOMC helps stabilize the economy in the face of these

developments through the stimulation of the overall demand using an easing of monetary policy that lowers interest rates. Conversely, when overall demand for goods and services is too strong, unemployment can fall to unsustainably low levels and inflation can rise. In these situations, the Federal Reserve guides economic activity back to more sustainable levels and keeps inflation in check by tightening monetary policy to raise interest rates. This process of the FOMC eases and tightens monetary policy to achieve its goals.²⁾



Figure 1: The transmission of Monetary Policy.³⁾

CBDC as a non-Cash Payments

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On average, each day, U.S. consumers and businesses make noncash payments worth roughly \ \$1/2 trillion currently using payments through:

- **debit cards**
- **credit cards**
- **electronic transfers**
- **checks**

Note: There is currently no tally for cryptocurrency payments.

To facilitate non-cash payments, intermediary banks hold **Reserve Balances** at the Federal Reserve. Payments are generally settled by transferring **Reserve Balances** between banks. Banks can also hold these balances to meet unexpected liquidity needs and to satisfy a number of regulatory requirements aimed at ensuring that banks are sound and that their customers' deposits are safe. Banks depend upon this borrowed money to a considerable extent in order to meet strict compliance requirements and pass stress tests used as the measurement of their financial stability.⁴⁾

Banks may borrow and lend reserves to each other depending on their needs and market conditions; as such, banks can use **Reserve Balances** both as a means of funding and as an investment. The federal funds rate is the interest rate that banks pay to borrow **Reserve Balances** overnight.

When a CBDC is created and goes public, CBDC payments will have to be added as a new way of making noncash payments. This means in order to obtain a better understanding of the banks' reserve currency requirements, all the CBDC payments in the bank need to be accounted for. In other words, these CBDC payments need to be added to the total tally of U.S. consumers' and businesses' noncash payments. This requires the CBDC to adopt a [Digital Account Model](#) leading to concerns about [End User Privacy](#).

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Examples

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The following “desirements” are from the [White Paper](#) as identified by the [Object Management Group's](#) report called [White Paper Analysis](#):

Table 2: Example of mapping a subset of requirements identified during the White Paper Analysis conducted by the OMG

Benefits	B0003, B0004, B0007, B0011, B0018, B0020, B0024, B0025, B0026, B0029, B0034, B0038, B0040, B0044, B0045, B0046, B0047, B0049, B0051
Policies	P0003, P0004, P0012, P0018, P0019, P0020, P0021, P0023, P0024, P0025, P0026
Risks	R0001, R0004
Design	D0004, D0005, D0009, P0010, P0018

Example Discussion

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Table 3: “Desirements” identified in the **White Paper** that have potential monetary policy impacts.

Statement No.	Statement	Comment
B0003	Complement, rather than replace, current forms of money and methods for providing financial services	The Cryptocurrencies and the CBDC need to be added to the tally of payments made by the intermediary banks in order for the Federal Reserve to calculate a correct Reserve Balance each bank needs to maintain overnight. So far, the Cryptocurrency payments have not had much of an impact on this calculation, but it is a matter of time before it does start having an impact. The adoption of a U.S. CBDC will definitely have an impact.
B0004	Protect consumer privacy	There is a fine line between collecting information about consumer transactions used to calculate the Reserve Balance for each bank and transgressing the required privacy requirements. See section 45_privacy .
B0007	Provide households and businesses a convenient and electronic form of central bank money with: 1. safety 2. liquidity	See P0018 - The Federal Reserve Act does not authorize direct Federal Reserve accounts for individuals. If it is amended to allow these accounts, then how will a Reserve Balance be calculated for the Federal Reserve commercial bank?

Statement No.	Statement	Comment
B0011	Make payments: 1. faster 2. cheaper 3. more convenient 4. more accessible	CBDC payments would be similar to the current non-cash payments done with debit cards, credit cards, electronic transfers, and checks. This has to be reported in order for the banks to calculate the Reserve Balance required by the Federal Reserve to banks. There is no reason that U.S. CBDC could not be treated similarly.
B0018	Allow the general public to make digital payments	The general public can already make digital payments using non-cash mechanisms such as debit cards, credit cards, electronic transfers, and checks
B0020	Maintain public confidence by not requiring mechanisms, such as deposit insurance	If the CBDC is treated like other non-cash mechanisms such as debit cards, credit cards, electronic transfers, and checks, there should be no reason to have an extra layer of protective insurance for CBDC.
B0024	Provide transactions finalized and completed in real-time	These transactions should be treated similarly to non-cash mechanisms such as debit cards, credit cards, electronic transfers, and checks. However, if a Stablecoin is used, then the transactions might be settled within minutes depending on the Consensus Algorithm used in the Stablecoin. See OMG DDO-RA Consensus Algorithms), answer to B0025 below, and R0010 - <i>CBDC has Risk of significant energy footprint similar to Cryptocurrencies</i> .
B0025	Serve as a new foundation for the payment system	The CBDC could offer another mechanism to the existing non-cash mechanisms such as debit cards, credit cards, electronic transfers, and checks. However, in order to offer real-time settlements, it may need to use a different mechanism than the existing Automated Clearing House (ACH) Network currently in use to electronically move money between banks accounts across the U.S. The current ACH network is run by an organization called Nacha, formerly the National Automated Clearing House Association (NACHA) .
B0026	Provide a bridge between legacy and new payment services	There definitely would need to be a bridge between the existing ACH-NACHA payment network and a U.S. CBDC, its associated Consensus Algorithms, and the network of nodes. However, in addition to the bridge between the two, there probably needs to exist a new consolidated frontend (Application Programming Interface (API) ?) that abstracts the type of payment from the participants in the transactions. In other words, the transaction should be agnostic to the non-cash mechanisms such as debit cards, credit cards, electronic transfers, checks, and CBDC.

Statement No.	Statement	Comment
B0029	Support basic purchases of: 1. goods 2. services 3. pay bills 4. pay taxes	See the answer to B0026 above. CBDC should be treated like any other payment form, even though under the hood, it might use a different payment network than the National Automated Clearing House Association (NACHA) network.
B0034	Generate new capabilities to meet the speed and efficiency requirements of the digital economy	See answers to B0025 , B0025 and B0029 above.
B0038	Allow private-sector innovators to focus on: 1. new access services 2. distribution methods 3. related service offerings	By defining a new standardized Application Programming Interface (API) as in B0026 above, a marketplace of products can be developed by the private sector to help innovate the current payment ecosystem.
B0040	Provide micropayment support	This is currently almost impossible with Credit and Debit cards because the cost of a transaction is so high that a vendor might lose money supporting small payments, let alone micropayments. A parallel network used by the CBDC might alleviate this problem depending on the Consensus Algorithm used by the U.S. CBDC. As an example: <i>You knew when you opened your merchant account that you'd have to pay for credit (and debit) card processing, but \$0.15 or \$0.20 per transaction (in addition to the percentage charge) didn't seem like it would be a big deal. Unfortunately, a lot of your customers come in and only buy a single item, maybe something for \$3.00 or less. They don't carry any cash and want to use their credit card. However, your margins are so thin on low-priced items that the fixed per-transaction fee you pay for processing can wipe out your profit. In fact, you might even lose money on some sales if the customer uses a credit card.</i>⁵⁾ The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 permits businesses to impose a minimum purchase amount of up to \$10 for credit card use, but the minimum must be the same for all credit card issuers and payment card networks. Part of this legislation, the Durbin Amendment, contains the following provision: <i>(3) NO RESTRICTIONS ON SETTING TRANSACTION MINIMUMS OR MAXIMUMS.—A payment card network shall not directly or through any agent, processor, or licensed member of the network, by contract, requirement, condition, penalty, or otherwise, inhibit the ability of any person to set a minimum or maximum dollar value for the acceptance by that person of any form of payment.</i>

Statement No.	Statement	Comment
B0044	Facilitate access to digital payments	See answers to B0011 , B0018 , B0020 , B0024 , B0025 , B0026 above.
B0045	Enable rapid and cost-effective payment of taxes	Sales taxes are already collected by the merchant at the point of sale. The Internal Revenue Service (IRS) uses third-party payment processors for payments by debit and credit card. It's safe and secure; your information is used solely to process your payment. ⁶⁾ 1. You can pay online or over the phone (see Payment Processor Contact Information below for phone payments) 2. You can pay using digital wallets such as PayPal and Click to Pay 3. There's a maximum number of card payments allowed based on your tax type and payment type 4. Employers' federal tax deposits cannot be paid by card; see how to pay employment taxes 5. For card payments of \$100,000 or more special requirements may apply Each state and local jurisdiction has different rules.
B0046	Enable rapid and cost-effective delivery of: 1. wages, 2. tax refunds 3. other federal payments	See answer B0025 , B0026 , B0029 , B0038 , B0040 above.
B0047	Lower transaction costs	See answer B0025 , B0026 , B0029 , B0038 , B0040 above.
B0049	Promote access to credit	See answer B0025 , B0026 , B0029 , B0038 , B0040 above.
B0051	Generate data about users' financial transactions similar to the current Commercial Bank⁷⁾ and nonbank_money	
P0003	Complement current forms of money and methods for providing financial services	See answer B0025 , B0026 , B0029 , B0038 , B0040 above.
P0004	Protect consumer privacy	See answer B0004 .
P0012	The firms that operate interbank payment services are subject to federal supervision	Regardless of how the U.S. CBDC is implemented, for example Stablecoin, the Consensus Algorithms need to include all the rules outlined in sections 45_privacy, 48_natsec, and 50_international. In other words, consensus includes the enforcement of the laws and regulations concerning Monetary Policy.

Statement No.	Statement	Comment
P0018	The Federal Reserve Act does not authorize direct Federal Reserve accounts for individuals	The easiest solution is to allow current intermediaries to process CBDC transactions using an upgraded payment system. See answer B0025, B0026, B0029, B0038, B0040 above.
P0019	Federal Reserve accounts for individuals represent a significant expansion of the Federal Reserve's role in the financial system and the economy	The easiest solution is to allow current intermediaries to process CBDC transactions using an upgraded payment system. See answer B0025, B0026, B0029, B0038, B0040 above.
P0020	The private sector would offer accounts or digital wallets to facilitate the management of CBDC holdings and payments	See answer B0025, B0026, B0029, B0038, B0040 above.
P0021	The intermediaries would operate in an open market for CBDC services	See answer B0025, B0026, B0029, B0038, B0040 above.
P0023	CBDC would need to be readily transferable between customers of different intermediaries	This would require standardization (Application Programming Interface (API) ?) that each intermediary would use to transfer money. The interface could be in the form of Web Services, Remote Procedure Calls (RPC), Common Object Request Broker Architecture (CORBA) , Data Distribution Service (DDS) or other interprocess communication mechanisms defined using ISO/OMG Interface Definition Language (IDL) , Web Services Interface Language (WSDL) , etc.
P0024	CBDC would need to comply with the U.S. robust rules	See answer to P0012 above.
P0025	CBDC intermediary would need to verify the identity of a person accessing CBDC	The Federal Open Market Committee (FOMC) is interested in the Reserve Balances of financial institutions within the U.S. There, if the transaction has one end of the transaction as a U.S. institution, then the ID of the individuals in the transaction is required.
P0026	CBDC transactions would need to be final and completed in real-time	See answers to B0024 and B0025 above.
B0013	Provide immediate access to transferred funds	See answers to B0024 and B0025 above.
R0001	Risk of affecting financial-sector market structure	See answers to B0025 , and B0025 above.
R0004	Risk to the efficacy of monetary policy	See answer to B0003 above.

Statement No.	Statement	Comment
D0004	Design should influence how the Federal Reserve might affect monetary policy	See answer B0025 , B0026 , B0029 , B0038 , B0040 above.
D0005	Design could affect monetary policy implementation and interest rate control by altering the supply of reserves in the banking system	From a Monetary Policy perspective, only the Reserve Balances are important. As long as the Reserve Balances account for Cryptocurrency and U.S. CBDC balances there should be little impact on the Monetary Policy.
D0009	Design should allow for significant foreign demand for CBDC, further complicating monetary policy implementation	The only reason to use the U.S. CBDC Stablecoin over U.S. Dollars is the potential for faster transactions using the CBDC transactions than in traditional ACH transactions. This would mean that before a transaction is to begin, the money in U.S. Dollars (or other currency) would be transferred to U.S. Stablecoins and the transaction would be conducted in Stablecoins. Once the transaction is completed, the Stablecoins could be changed quickly for U.S. Dollars. The only reason to hold onto the Stablecoins is to conduct more transactions using the Stablecoin network.
D0010	Design should consider the potential for interest-bearing CBDC as a new policy tool on the channels of influence in monetary policy	This would vary greatly from the current way the Credit Cards, Debit Cards, and Checks currently work. These are backed by accounts that can receive interest. For example, debit cards and checking accounts can pay interest on positive balances. These checking accounts could maintain separate balances for U.S. Dollars and for Stablecoins. But since Stablecoins would be backed by U.S. Dollars anyway, it seems a bit of a moot point unless the value of the U.S. Dollar and the U.S. Stablecoins are allowed to diverge.
R0018	Risk a CBDC could fundamentally change the structure of the U.S. financial system, altering the private sector and central bank: 1. roles 2. responsibilities	See answers to B0025 , and B0025 above.
B = Benefit Considerations		
P = Policy Considerations		
R = Risk Considerations		
D = Design Considerations		

1)

The Federal Reserve Education.org, [Monetary Policy Basics](https://www.federalreserveeducation.org/about-the-fed/structure-and-functions/monetary-policy), Accessed: 17 April 2022, <https://www.federalreserveeducation.org/about-the-fed/structure-and-functions/monetary-policy>

2) 3)

Federal Reserve, [Monetary Policy: What Are Its Goals? How Does It Work?](https://www.federalreserve.gov/monetarypolicy/monetary-policy-what-are-its-goals-how-does-it-work.htm) Accessed: 18 April 2022, <https://www.federalreserve.gov/monetarypolicy/monetary-policy-what-are-its-goals-how-does-it-work.htm>

4)

During the 2008 financial crisis, many big banks failed or faced insolvency issues due to liquidity problems. The FDIC ratio is in line with the international Basel standard, created in 2015, and reduces banks' vulnerability in the event of another financial crisis.

5)

Chris Motola, [Can You Set A Minimum Purchase Amount For Credit & Debit Card Payments?](#), 14 January 2022, Accessed: 18 April 2022,

<https://www.merchantmaverick.com/can-merchants-set-minimum-amounts-on-card-transactions/>

6)

Internal Revenue Service (IRS), [Pay Your Taxes by Debit or Credit Card or Digital Wallet](#), Accessed: 14 April 2022, <https://www.irs.gov/payments/pay-your-taxes-by-debit-or-credit-card>

7)

Commercial banks include banks licensed either by federal or state banking agencies, credit unions, and thrifts from the **White Paper**.

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