Central Bank Digital Currency and the Future of Monetary Policy

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May 4, 2017

Remarks at Hoover Institution Policy Conference on "The Structural Foundations of Monetary Policy"

Introduction

- Many central banks are actively exploring the launch of digital currencies within the next few years. Unlike bitcoin and other virtual currencies, CBDC would be fixed in nominal terms just like paper currency.
- Recent studies on CBDCs have generally focused on technical & logistical issues regarding payments.
- In contrast, our analysis considers how CBDC can transform all aspects of the monetary system, facilitate systematic & transparent monetary policy, and foster true price stability.

Fundamental Design Principles

The following principles draw on a very long strand of literature in monetary economics:

- **Medium of Exchange. CBDC should serve as legal tender usable for all payment transactions, public & private.**
- **Store of Value. CBDC should be account-based (not token-based like bitcoin) and should be interest-bearing at the same nominal interest rate as short-term government securities.**
- **Unit of Account. CBDC should provide a nominal anchor, and hence its real value should remain stable over time in terms of a general index of consumer prices.**

Medium of Exchange

- **Public Good.** Increasing returns and externalities provide a strong rationale for a government-issued currency, as emphasized by Adam Smith (1776).
- **Legal Tender**. CBDC will be valid for all payment transactions, public & private.
- **Universal Access.** Any individual, firm or organization may hold funds in a CBDC account at the central bank.
- **Efficiency of Payments**. Transactions will be practically instantaneous & costless, because the central bank simply debits the payer's CBDC account and credits the payee's CBDC account.

Medium of Exchange (contd.)

- **Complementarity.** As in the present monetary system, individuals & firms may hold funds at private financial institutions and make payments via private networks. Indeed, most transactions will continue to be private.
- **Obsolescence of Cash.** Once CBDC is widely used for payments, the demand for paper currency will quickly diminish, especially if cash deposits & withdrawals are associated with substantial fees.
- **Privacy**. Individuals will be free to engage in **relatively** anonymous transactions by using virtual currencies or other private forms of payment.

Store of Value

- **Efficiency of the Monetary System.** Publicly-issued money should bear the same rate of return as other risk-free assets; cf. Friedman (1960).
- **Universality**. Central banks already pay interest on the reserves of commercial banks, and some (including the Federal Reserve) have begun paying interest to a much wider array of counterparties.
- **Flexibility.** The CBDC interest rate will be the central bank's key monetary policy tool. With obsolescence of cash, this rate can be cut below zero in response to a severe adverse shock; cf. Goodfriend (2016).

Unit of Account

- **Economic Efficiency.** A stable unit of account facilitates the decisions of households and firms and the determination of nominal wages & prices.
- **No Need for Inflation Buffer.** Because the CBDC interest rate can be adjusted downward as needed, there will no longer be a compelling rationale for the central bank to target a positive average inflation rate.
- **True Price Stability.** Therefore, the monetary policy framework should ensure that the real value of CBDC remains stable over time, as measured in terms of a general index of consumer prices.

Unit of Account (contd.)

- **Comparison to Gold Standard.** This design for CBDC embeds the most appealing features of the classical gold standard while avoiding its pitfalls. Indeed, the general price level was **not** stable during that era; cf. Bordo (1984).
- **Other Proposals.** This approach is distinct from the "tabular standard" (Jevons 1875, Marshall 1877) and the "compensated dollar" (Fisher 1913 ff.), which involved indexation to past inflation. A closer parallel is Wicksell (1898), who analyzed how interest rate adjustments could foster true price stability.

Fostering Price Stability

- **Specification. The price level target should be specified in terms of a broad measure of consumer prices, using publicly-posted prices and chain-weighting, and this specification should not be modified except for compelling technical reasons.**
- **The Nominal Anchor. The price level will inevitably fluctuate in response to exogenous shocks, but monetary policy should ensure that the price level returns to its target over time, thereby anchoring the expectations of households & firms.**

Fostering Price Stability (contd.)

- **Transitory vs. Persistent Shocks. Given the lags in the monetary transmission mechanism, monetary policy should avoid responding to transitory shocks and hence place greater emphasis on "core" measures.**
- **The Natural Interest Rate. As in Wicksell (1898), the appropriate setting of the nominal interest rate involves assessments of the equililibrium real rate *(r*)*.**
- **Measures of Slack. As in flexible inflation targeting, the stance of monetary policy should be adjusted in response to measures of slack, i.e., the output gap or the employment gap.**

The Monetary Policy Framework

- **Transparency.** The monetary policy framework should be systematic and transparent, thereby facilitating the effectiveness of monetary policy and the central bank's accountability to elected officials and the public.
- **Simple Benchmarks.** There are compelling benefits to framing the central bank's policy strategy in terms of a simple benchmark; cf. Taylor (1993, 1999).
- **Practicalities.** Simple benchmarks cannot be followed mechanistically, but the central bank should clearly explain any deviations as well as any occasional adjustments to the benchmark itself; cf. Levin (2014).

A Simple Benchmark for Price Stability

$$i_t = \tilde{\pi}_t + r_t^* + \alpha(\tilde{p}_t - p^*) + \beta(p_t - p^*) + \delta(y_t - y_t^*)$$

where i_t denotes the CBDC interest rate, p_t is the overall price level, $\tilde{p}_t$ is the core price level, and p^* is the target. Each price is expressed in natural logarithms, so that $(p_t - p^*)$ is the percent deviation of the actual price level from its target. Policy responds more strongly to the core measure than the overall measure of prices, i.e., $\alpha >> \beta$. This benchmark also involves the core inflation rate ($\tilde{\pi}_t$), the equilibrium real rate (r_t^*), and the output gap $(y_t - y_t^*)$.

Macroeconomic Benefits

- **Productivity.** By eliminating payment transaction costs, the CBDC significantly raises the productivity of the macroeconomy; cf. Barrdear & Kumhof (2016).
- **Macroeconomic Stability.** A large number of analytical studies have concluded that transparent & credible price-level targeting enhances macro stability.
- **Comparison to Nominal GDP Targeting.** Our simple benchmark encompasses NGDPT as a special case (p_t = GDP price index, $\beta = \delta$). But the GDP price index is a value-added deflator, not an index of final prices, and hence not ideal as an anchor for the unit of account.

The Central Bank's Balance Sheet

- **Simplicity.** Under this framework, the central bank will be able to respond to a severe adverse shock without resorting to QE or other measures aimed at modifying the size or composition of its balance sheet.
- **Transparency.** The central bank's balance sheet will be highly transparent, with assets of short-term government securities matching its liabilities of CBDC.
- **Operating Procedures.** The central bank will engage in purchases and sales of short-term government securities to equate the supply and demand for CBDC.

Interactions with Fiscal Policy

- There will generally be a negligible interest rate spread between CBDC and short-term government securities, and hence the size of the central bank's balance sheet will have no direct fiscal consequences.
- With obsolescence of paper currency, the central bank will no longer generate substantial seignorage and will simply cover its expenses via miniscule fees on payment transactions.
- The maturity composition of government securities held by the public will be determined by the fiscal authority, not the central bank; cf. Greenwood et al. (2014).

Lender of Last Resort

- During a financial crisis, the central bank should be able to expand the stock of CBDC as needed to provide emergency liquidity to supervised financial institutions.
- Alternatively, the central bank could extend such emergency liquidity to another public agency, such as the bank regulator or deposit insurance fund.
- Appropriate legal safeguards will be crucial to ensure that LOLR actions do not undermine the central bank's ability to carry out its commitment to price stability.

Conclusion

"Central bankers throughout the world, from Canada to Ireland, have recently indicated that they might issue digital currency in the future. Yet the U.S. has been absent from the debate. As the world's central monetary power, America should play a leading role in studying the benefits and pitfalls of a digital-currency future.... The march of digital commerce may eventually make the benefits seem overwhelming, and it would be wise to be ahead of the game rather than trying to catch up at the last minute."

M. Raskin & D. Yermack (WSJ, 8/5/16)