Would elimination of currency remove the zero lower bound on nominal policy interest rates?

James McAndrews, Executive Vice President and Director of Research
The views expressed in this presentation are those of the author’s and do not necessarily reflect the views of the Federal Reserve Bank of New York or of the Federal Reserve System.
In a word:

No.
Currency: a bearer instrument with two purposes

a store of wealth — where the cost of storage through time is important, and

a means of payment — where the cost of transfer is important.

Using currency to accomplish these purposes, particularly in the context of small sums, is efficient because it does not rely on social contrivances like bank checking accounts, credit card systems, depositories, etc. — all of which are efficiently used in storing and/or transferring large sums.
Currency is used for tax avoidance and illegal activities.

Currency, paying a zero nominal rate of interest, can be used to avoid negative nominal rates on bank deposits.

Consequently, eliminating currency would allow central banks to employ deeply negative nominal policy rates, and it would also reduce some social costs.
Proposals to eliminate currency in order to facilitate nominal interest rates below zero are concerned with the store of wealth aspect and ignore the utility of currency as a means of payment.

Eliminating currency may be throwing out the baby with the bathwater, especially when there are other, readily available, substitute ways to store nominal value at a zero nominal rate.
As an aside, there are many uses of currency, not only or even predominantly, the noxious ones.

So far, electronic alternatives are poor substitutes, and will likely remain so for a long time.

Anonymity is an economic use of currency that is both important and difficult to replace.
Storage technologies

One use of money is to provide a store of value.

Over time, alternative technologies have been used as a storage technology, including commodities, as a real storage good.

Central banks, among other things, have perfected a nominal, yet safe, method of storage with currency.

Real returns on currency vary with inflation, so deeply negative real returns are possible.
Substandard storage

Currency can be successfully eliminated, or negative rates of interest imposed on currency, only with full centralization of the payments system through the central bank.

More likely, were currency elimination tried, is that private storage technologies would be introduced as alternatives to incurring negative rates of interest on currency, including, simply, private currencies.

To eliminate a good storage technology is likely a first order welfare loss to society, in the hopes that there will be second order gains from the possible elimination of the ZLB.
Garbade and McAndrews (2012) point out many other zero interest rates available in society, including many contractual terms, such as prepayment of taxes, credit cards, trade credit, etc.

Agents would renegotiate these deals in the long run, faced with deeply negative rates.
Eliminating currency would not eliminate the zero lower bound as agents would employ alternatives to avoid negative rates at banks.

For example, shares in mutual funds using financial engineering (a la Gorton and Pennachi (1998)) that hold safe long-term bonds (that earn positive or zero yields) could serve as an alternative currency.

Trade credit, tax payments, and many other methods would be employed by people to avoid negative rates, reducing the ability of the central bank to impose negative policy rates.