Leon Berkelmans discusses how deep negative interest rates can be implemented by eliminating the zero lower bound.

**Challenge**

There are many ways that this issue could be dealt with. A popular suggestion is that fiscal policy could be used in order to push up demand and generate inflation. The abolition of cash has also been suggested, so agents would not have the ability to transfer out of deposits. These suggestions have their drawbacks. The political process may not be able to deliver the fiscal stimulus at the right time, or in the right magnitude. Cash is the only means of transacting for the unbanked, which makes up around eight percent of US households.

There is an alternative. It involves breaking the one-for-one link between electronic (bank) money and physical currency. Essentially, there would be a time-varying exchange rate between paper money and money in the bank.

To understand this mechanism, first we must understand why physical currency imposes a constraint on how low interest rates can go. If interest rates became negative on a deposit account, meaning that account holders would see their balances fall over time, then there is an incentive to hold cash instead, which retains its nominal value.

In order to eliminate the constraint it is necessary to have physical cash fall in value. This is possible. It can be achieved by having physical cash trade at a time-varying exchange rate with electronic cash.

At present, if an individual has a dollar in their pocket, they can deposit it and have one dollar in their bank account. This one-to-one link can be broken, so that the depositor may be credited something different to their account. This exchange rate would be implemented by the central bank. Commercial banks have deposits at the central banks, which they redeem for physical cash when the need arises, or deposit excess physical cash when they have a surplus. To implement an exchange rate of x physical dollars per electronic dollar, the central bank would deem that one electronic dollar on deposit at the central bank is worth x dollars of physical currency. This price would then be transmitted through the rest of the economy the same way as interest rate changes are transmitted through the economy from the central bank: through arbitrage.

If the one-to-one link between electronic money and physical cash is broken, then physical cash's value can fall through a depreciating exchange rate. Suppose that the central bank wants to implement an interest rate of -10 percent for a year (it is unlikely this would ever happen, but this is for illustrative purposes). Then, if physical cash were to see its value stay the same, there would be a strong incentive to convert money on deposit into cash. On the other hand, suppose that the central bank were to have the value of physical cash depreciate by 10 percent over that year, so that by the end of the year one physical dollar is worth 90 electronic cents. Then, in that case, there is no incentive to hold cash, and the negative interest rate can be implemented.
When interest rates return to positive territory, the central bank could have the value of physical cash appreciate. In theory, there is no reason that we need the one-to-one link restored, so that the physical dollar could go up in value to the point that it would be worth more than an electronic dollar. However, it may be politically more palatable for normal operations to be resume when parity is restored. If that occurs, this framework would result in a world looking exactly like the one we have now most of the time.

If central banks could implement deep negative rates, this would have a strong stimulatory effect on demand when the economy needs it most. One analysis by Federal Reserve economists suggested that unemployment would have been 3 percentage points lower in 2012 had they been able to cut interest rates to negative 4 per cent.

Politically, this idea faces some difficulties. Many are hostile to negative rates. Setting an exchange rate between physical and electronic money could be viewed as financial sorcery. But with education, negative rates will become more accepted over time.

We have already seen policy rates in some countries go into negative territory, albeit by 0.75 percentage points at most. This means the taboo has already been broken. And the political battle can be won if the choice is set up for what it is: impose negative rates for a short time on some riskless assets, or accept elevated unemployment for years.

Economies have experienced varying exchange rates between types of monies before. For example, in the United States during the Free Banking Era in the United States between 1838 and 1863, thousands of different banknotes circulated, issued by different banks. These banknotes traded at varying exchange rates that depended, upon other things on distance from the issuing bank. There were tables of prices for currency distributed as part of publications called “bank note reporters”. This system did not cause chaos, and the proposal here is far simpler, at a time when information is far easier to come by.

Economists would notice a difference. Physical cash would have a different value to electronic money, so there would be a different price depending upon the mode of payment. But to some extent, that happens already. Currently, cash payments are rewarded with a discount on some occasions in order to avoid credit card transaction fees.

Some wrinkles need to be ironed out before this is ready for prime-time. In particular, long term contracts made out in unspecified “dollars” would lend themselves to repayment in depreciated physical currency if no provision were made for the contingency. This could be avoided by having the government pass a law that said that unless otherwise specified, contracts had to be settled with physical currency. These and other wrinkles are by no means insurmountable.

Proposal

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How would this look to the person on the street? In normal times, exactly the same as the world looks today. At times of negative interest rates, there would be some changes. They may earn negative returns on their savings parked in a bank, but that is a feature not a bug. It would give them an incentive to move out of deposits into something else. The interest rate on borrowing would be lower, but it would take quite a severe shock for most borrowers to face negative rates. The borrowing rate most borrowers face is a substantial spread above the policy rate, so policy rates would have to be deeply negative before that Rubicon were crossed. Nonetheless, it is possible. Many governments are now borrowing at negative rates, and some private corporations have seen their bonds trade at negative rates.

Customers in shops would notice a difference. Physical cash would have a different value to electronic money, so there would be a different price depending upon the mode of payment. But to some extent, that happens already. Currently, cash payments are rewarded with a discount on some occasions in order to avoid credit card transaction fees.
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