Bank Market Power and Central Bank Digital Currency: Theory and Quantitative Assessment

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Motivation: many countries are thinking of CBDCs and many are worried about the effects on the banking sector.

Question: how introduction of CBDC is going to affect lending and investment in an economy where banks have market power?

Idea: interest paying CBDC can encourage banks to raise interest rate on deposits, which in turn increases supply of deposits and lending in the economy.

Surprising result: zero interest CBDC can have the same effect!!!

What the paper does

- builds a micro-founded general equilibrium model with demand for money as in Lagos and Wright (2005)
- studies theoretically competition between CBDC and checkable bank deposits
- calibrates the model to the US data and finds that CBDC can increase lending by 1.96%

Key ingredients

1. Demand for monetary instruments Lagos and Wright (2005)
   - each period in decentralized markets (DM) buyer can meet seller of 3 different types:
     1. accepts only cash (fraction w_1)
     2. accepts deposits and CBDC (fraction w_2)
     3. accepts all (fraction w_3)
   - seller's type ex ante unknown $\rightarrow$ buyer has to carry all currencies in order to consume

2. Only banks can create checkable deposits, which is cheap funding for them.

3. Banks have market power (Cournot) $\rightarrow$ make profits, attract inefficiently little deposits and lend less.

Main Mechanism

Real interest paid on CBDC R_e can increase real interest rate paid on deposits R_d and can increase deposits and lending.
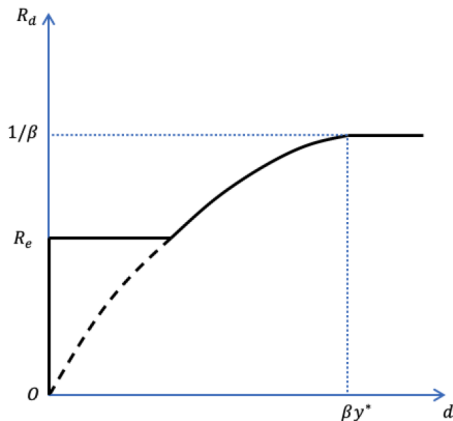
Zero interest CBDC

Can zero-interest CBDC play a role in the economy? Yes! it puts a zero rate floor for checkable deposits.

In my opinion this is extremly relevant as effective real rates for checkable deposits can be negative.

As authors point out, growth in electronic payments and less cash usage create extra demand for checkable deposits and let banks earn extra profits by lowering real rates on checkable deposits below zero, which is bad for lending!

Application

The paper seems extremely relevant, because in Russia real interest rates on checkable deposits are negative.

Currenly Sberbank (the large russian bank) offers 3.5% nominal rate (negative real rate) on checkable deposits (attached to a card), the inflation of around 4% makes real rate negative. Also Sberbank charges fees for wiring money

Комиссия за переводы

Через приложение или личный кабинет СберБанк Онлайн, а также через СМС	До 50 000 ₽ — в месяц без комиссии
	Больше 50 000 ₽ в месяц — комиссия 1% от суммы перевода, но не более 1500 ₽. Без комиссии, если есть подписка на переводы
Через банкомат или терминал	1% от суммы перевода, но не более 1500 ₽
В офисе СберБанка	1,5% от суммы перевода — от 30 ₽ до 1500 ₽

CBDC introduction in Russia

Currently Bank of Russia(BoR) rate is 6.75%: so Sberbank can invest at this rate and fund itself with checkable deposits at 3.5% without passing the BoR rate to households.

If BoR introduces a CBDC with a nominal rate of 5% this would encourage Sberbank to raise nominal rate on checkable deposits to 5%, thus attracting more money from households to checkable deposits.

Comments

Why focus on competition between CBDC and bank deposits only? What would happen if CBDC will actually substitute cash?

If CBDC pushes out cash, aspects of tax evasion and transparency should be taken into account.

Central bank money are exchanged at par (reserves, cash, CBDC), is this necessary? Since different instruments have different liquidity premia (usage) they can actually have an equilibrium exchange rate not equal to one.

CBDC and reserves seem to be a very similar form of central bank money, what happens if banks can hold CBDC as reserves?

Does the model work with negative interest rates?

Comments on the model/exposition/extensions

I could not find the balance sheet of the central bank (government), it prints money, pays interest on CBDC and reserves, and does transfers.

It would be good to have the balance sheet of the central bank explicitly.

Government bonds? What the central bank can do with CBDC accounts? Maybe one can introduce government bonds and let the CB buy them, so to separate fiscal and monetary authorities in the model.

Securitization? An alternative could be some kind of securitization of commercial loans: suppose B can buy a fraction of loans issued by commercial banks, this would provide extra liquidity to banks and may increase lending.

Question about calibrations

To estimate how likely buyers are to use different means of payments you use number of transaction done with cash (11%), online, etc. But you do not seem to take into account the size of the transaction. Can you estimate what fraction of the expenditure goes through cash/checkable deposits and can this affect your predictions?

Final Remarks

Great paper! Each Central Bank should carefully read it it.

More careful and detailed calibration could be of great value for policy decisions.