Inside Money, Investment, and Unconventional Monetary Policy

L. Altermatt, University of Basel

discussion by Federico Signoretti (Banca d'Italia)

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"Aggregate and Distributive Effects of Unconventional Monetary Policies"

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DISCLAIMER: The views expressed here are my own and do not necessarily reflect those of Banca d'Italia.

Summary (if needed)
The model

- New monetarist model (*à la* Lagos and Wright, 2005; Williamson, 2012)
- Inside and outside money
- Some sellers only accept cash transactions => currency is different from bank deposits
- Banks invest in bonds, reserves and productive capital
- Define various equilbria; one is characterized by a "liquidity trap"
- Discuss effectiveness of various policy: CMP, HD, NIRP, FP

Summary (if needed)
Results

- Increases in inflation are always “bad”, also in a liquidity trap
- In a liquidity trap CMP is ineffective…
- …while UMP (i.e., HD and NIRP) is effective, though not clear if welfare improving
- A higher bond-to-money ratio decreases probability of ending in a liquidity trap

This discussion

About	The two key results on MP effectiveness: 1. Conventional MP is ineffective 2. Unconventional MP is effective
Claim	Functioning of MP in the model has important differences with MP implementation in reality
Suggestion	Incorporate (some of) these features in your model: appetibility of results/paper would increase
In addition	Other comments/questions which I won't have time to discuss!

#1 Conventional monetary policy

In the model

- Banks *compete* for deposits owned by agents
- Banks are *forced* to invest a share of deposits in required reserves
- Banks decide how to allocate the rest of their balance-sheet between bonds and productive capital (loans)

⇒ Once the ZLB is hit, OMO only change the composition of banks' balance-sheet, as bonds (purchased by the CB) are replaced with reserves

⇒ Total amount of assets/loans (and money) in the economy stays the same

⇒ OMO have no effect on inflation and the economy in general

#1 Conventional monetary policy

In reality

- Banks *create* deposits (=money) out of loans
- The amount of reserves is provided by the CB *endogenously*
- Reserve requirement is *not a constraint* on the amount of lending
- CB controls money creation via the sort-term interest rate (demand and supply of loans)
- Loans and money creation also limited by bank regulation, banks' profit maximization

➢ An example

➢ Credit to: G. Ferrero, *Monetary Policy in a Modern Monetary System*, mimeo)

#1 An example of money creation and monetary policy in modern economies (0 / 6)

Hypotheses

- Reserve requirement = 2% of deposits in the previous maintenance period (to be fulfilled on average in the current maintenance period)
- Maintenance period = 2 days
- No autonomous factors
- No excess reserves in the system

#1 An example of money creation and monetary policy in modern economies (1 / 6)

Day 1: Each bank obtains 2€ of reserves in MRO and places them in the reserve account (C/Res.) at the CB …

Bank A			
Assets		**Liabilities**	
C/Res.	2€	Deposits	100€
Loans	120€	OMO CB	2€
Assets	10€	Bonds	10€
		Capital	20€

Bank B			
Assets		**Liabilities**	
C/Res.	2€	Deposits	100€
Loans	120€	OMO CB	2€
Assets	10€	Bonds	10€
		Capital	20€

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… Bank A **lends** 1 € to firm A…

Bank A			
Assets		**Liabilities**	
C/Res.	2€	Deposits	101€
Loans	121€	OMO CB	2€
Assets	10€	Bonds	10€
		Capital	20€

No need for reserves to make a loan

#1 An example of money creation and monetary policy in modern economies (2 / 6)

… firm A buys machinery from firm B, depositor of Bank B …

Bank A			
Assets		**Liabilities**	
C/Res.	1€	Deposits	100€
Loans	121€	OMO CB	2€
Assets	10€	Bonds	10€
		Capital	20€

Reserves are used to settle payments

Bank B			
Assets		**Liabilities**	
C/Res.	3€	Deposits	101€
Loans	120€	OMO CB	2€
Assets	10€	Bonds	10€
		Capital	20€

#1 An example of money creation and monetary policy in modern economies (2 / 6)

… firm A buys machinery from firm B, depositor of Bank B …

Bank A			
Assets		**Liabilities**	
C/Res.	1€	Deposits	100€
Loans	121€	OMO CB	2€
Assets	10€	Bonds	10€
		Capital	20€

Reserves are used to settle payments

Bank B			
Assets		**Liabilities**	
C/Res.	3€	Deposits	101€
Loans	120€	OMO CB	2€
Assets	10€	Bonds	10€
		Capital	20€

… at the end of day 1 Bank B moves 1€ to deposit facility…

Since reserves in excess to res.requir. are not remunerated in the reserve account, Bank B at the end of the day move excess reserves to the deposit facility

Bank B			
Assets		**Liabilities**	
C/Res.	2€	Deposits	101€
Dep.Fac.	1€	OMO CB	2€
Loans	120€	Bonds	10€
Assets	10€	Capital	20€

#1 An example of money creation and monetary policy in modern economies (3 / 6)

Day 2: At the end of the maintenance period Bank A borrows1€ in the money market (MM) from Bank B to fulfill reserve requirement …

Bank A			
Assets		**Liabilities**	
C/Res.	2€	Deposits	100€
Loans	121€	MM debt	1€
Assets	10€	OMO CB	2€
		Bonds	10€
		Capital	20€

Bank B			
Assets		**Liabilities**	
C/Res.	2€	Deposits	101€
Dep.Fac.	0€	OMO CB	2€
MM loans	1€	Bonds	10€
Loans	120€	Capital	20€
Assets	10€		

#1 An example of money creation and monetary policy in modern economies (4 / 6)

… since in day 1 Bank A deposited only 1€ in the reserve account, in order to satisfy the reserve requirement it still need 1€ of reserves Bank A goes in **marginal lending** with the Central Bank …

Bank A			
Assets		**Liabilities**	
C/Res.	3€	Deposits	100€
Loans	121€	ML CB	1€
Assets	10€	MM debt	1€
		OMO CB	2€
		Bonds	10€
		Capital	20€

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#1 An example of money creation and monetary policy in modern economies (5 / 6)

***Day 3**: Bank A and B settle their debts with the Central bank …*

Bank A			
Assets		**Liabilities**	
C/Res.	0€	Deposits	100€
Loans	121€	ML CB	0€
Assets	10€	MM debt	1€
		OMO CB	0€
		Bonds	10€
		Capital	20€

Bank B			
Assets		**Liabilities**	
C/Res.	0€	Deposits	101€
MM loans	1€	OMO CB	0€
Loans	120€	Bonds	10€
Assets	10€	Capital	20€

#1 An example of money creation and monetary policy in modern economies (6 / 6)

…and contemporaneously obtain new reserves in MRO to satisfy the new reserve requirement …

Bank A			
Assets		**Liabilities**	
C/Res.	2€	Deposits	100€
Loans	121€	MM debt	1€
Assets	10€	OMO CB	2€
		Bonds	10€
		Capital	20€

Bank B			
Assets		**Liabilities**	
C/Res.	2.02€	Deposits	101€
MM loans	1€	OMO CB	2.02€
Loans	120€	Bonds	10€
Assets	10€	Capital	20€

#1 An example of money creation and monetary policy in modern economies: summing up

- Central banks provide the amount of reserves necessary to meet the liquidity needs of financial institutions;
- Commercial banks have the ability to create (inside) money by granting new loans, which in turn generate deposits
- Implications:

  ⇒ an increase in reserves has *per se* no effect on inflation, i.e., it only increases excess reserves

  ⇒ Inflation is controlled via changes in the interest rate (C,I intertemporal subs; wealth effects/asset price ch, broad credit channel)

  ⇒ In a liquidity trap, key limit to CMP effectiveness is that (the short-term) interest rate can not be lowered further (ZLB)

#2 Unconventional monetary policy (UMP)

In the model

- HD is effective because it mechanically increases money
- NIRP is effective because it practically rules out the liquidity trap equilibrium, so CMP regains control of inflation

In reality

- HD has not been tested. Effectiveness (in ↑ inflation) not mechanical: will crucially depend on the ability to stimulate consumption/investment decisions
- NIRP main objective was to reduce short-term rate beyond ZLB (coupled with excess liquiidty) -> more in line with how CMP works

- What else?
- Quantitative easing, forward guidance, credit easing -> next slide

#2 Unconventional monetary policy (UMP)

- Main objectives: reduce interest rates at longer maturities (still above ZLB), stimulate lending
- Direct effects on interest rates…
  - on the risk-free component (signaling channel)
  - on the term-premia (scarcity channel)
- … on inflation expectations (and confidence)…
- …and on cost and availablity of bank funding
- Indirect effects
  - yields of other financial assets
  - cost and availability of bank loans
  - capital gains on asset holders (wealth channel)
  - depreciation of domestic currency
  - easing the terms of public financing

#3. Other comments (questions)

1

- Inflation is never welfare improving in the model
- Key risk before undertaking QE was deflation and debt-deflation spiral

Question: How important is this channel/risk, which is missing in the model?

#3. Other comments (questions)

2

- The probability of a liquidity trap is higher if bonds are scarce (i.e bond-to-money ratio is low)
- This underpins model's prediction for a role for expansionary fiscal policy

Question: How important is that the model is missing any possible negative consequences of an increase in public debt?

#3. Other comments (questions)

3

- In the model, f(k) is a “fundamental”
- Thus, its role is not discussed

Question: Isn’t (low) return on capital one key determinant of liquidity trap?

- Uncertainty on future economic conditions (“animal spirits”)
- Secular stagnation

Thank you