

University Paris Saclay, 2016-2017

ECO 584

Current Macroeconomic Issues

Benoit Mojon

- 1 **Macroeconomic stabilisation policies**
- 2 **Why is inflation so low?**
- 3 **Why are interest rates so low?**
- 4 **Non conventional monetary policies: are they effective?**
- 5 **A balance sheet perspective on financial intermediation and central banking, 1 February 2017**

Outline

1. Introduction: What Money is
2. Money (i.e. central banking) and financial intermediation: a balance sheet perspective
3. A bank balance sheet and profit and loss account approach: Monti-Klein
4. Ongoing substitutions between private and public monies: the balance sheet policies of the ECB and the Fed

5.1 Introduction: What Money is

- **Monetary policy is the supply of money**

Money is a debt that is used to settle other debts. It is the legal tender for transactions.

The transaction role of money and the double coincidence of needs. (Complementary reading: *Money is memory*, Kocheerlakota).

Money is issued by central banks who were initially the banker of the sovereign who granted them the privilege of issuing money in exchange of favorable financing conditions.

During the 19th century, they became the bank of banks. Payments systems are hierarchical.

Financial crises and the Lender of Last Resort. (Complementary reading: *Central Banking*, Aglietta and Mojon)

5.2 A balance sheet view of financial intermediation

5.2.1 Financial intermerdiation

Financial intermediation			
Bank A		Bank B	
assets	liabilities	assets	liabilities
Reserves 9	Deposits (of H) 90	Reserves 1	Deposits (of F) 10
mortgage 50		Loans 40	
CD 41			CD 41
	Capital 10	Bonds 20	Capital 10
Household H, client of A		NFC F, client of B	
assets	liabilities	assets	liabilities
House 60	mortgage 50	factory 70	Loans 40
Stocks 40		deposits 10	Bonds 20
Deposits 90			
	Net wealth 140		Capital 20

Figure 1: Illustration of reserve requirements and liquidity financing through the interbank market

Banking system			
assets		liabilities	
Reserves	10	Deposits	100
Loans + mortgage	90		
CD	41	CD	41
		Capital	20
Bonds	20		
credit	110	money	100

Central bank			
assets		liabilities	
Reserves	10	Reserves	10
Gold + forex	10	notes	10

Figure 2: View of the aggregate banking system and the central bank balance sheet

5.2.2 Monetary/credit creation

Discuss

1. Credit makes deposits?
2. How do reserve requirements limit monetary creation?
3. Two instruments of monetary policy: changes in reserve requirements and the interest rate on reserves:the supply of reserves?

Increase in credit and hence money			
Bank A		Bank B	
assets	liabilities	assets	liabilities
Reserves 12	Deposits (of H) 120	Reserves 2	Deposits (of F) 20
mortgage 50	Foreign borrow 4	Loans 80	CD 72
CD 72	Capital 10	Bonds 20	Capital 10
Household H, client of A		NFC F, client of B	
assets	liabilities	assets	liabilities
House 60	mortgage 50	factory 100	Loans 80
Stocks 40		deposits 20	Bonds 20
Deposits 120			Capital 20
	Net wealth 170		

Figure 3: Bank B extend credit to the firm by 40, increasing its deposits by 10, and buying a new factory to households for 30

5.3 The Monti-Klein model of banking: an IO perspective

The balance sheet of the bank is given by

Assets		Liabilities	
Reserves	R	Deposits	D
Loans	L	Capital	K

The reserve are typically (traditionally) are paid no interest. It is a "tax" on financial intermediation and banks try to keep it as low as possible:

$$R \geq \alpha D$$

$$R = \alpha D$$

This model assumes a monopolistic bank which is collecting deposits, confronted to an upward sloping deposit supply [$D^S = D(r_D)$ or its inverse function $r_D(D)$], and supplying loans, confronted to a downward sloping loan demand [$L^D = L(r_L)$ or its inverse function $r_L(L)$]:

Let us now consider the profit function of this monopolistic bank assuming its capital as given and the level of the money market rate r also as given:

$$\Pi(L, D) = (r_L(L) - r)L + (r(1 - \alpha) - r_D(D))D - C(D, L)$$

$C(D, L)$ is a cost function for doing financial intermediation, essentially about the non financial (independent from interest rates) costs such as network of branches, advertisement, recruiting, IT,...

The first order conditions are

Banking system			
assets		liabilities	
Reserves	14	Deposits	140
Loans + mortgage	130	Foreign borrowing	4
CD	72	Gross CD	72
		Capital	20
Bonds	20		
credit	150 money		140

Central bank			
assets		liabilities	
Reserves	14	Reserves	14
Gold + forex	10	notes	10

Figure 4: Aggregate banking system and central bank balance sheets

$$\frac{\partial \Pi}{\partial L} = r'_L(L)L + (r_L(L) - r) - C'_L(D, L) = 0$$

$$\frac{\partial \Pi}{\partial D} = -r'_D(D)D + r(1 - \alpha) - r_D(D) - C'_D(D, L) = 0$$

Introducing the elasticities of loan demand and deposit supply:

$$\varepsilon_L = \frac{r_L L'(r_L)}{L(r_L)}; \varepsilon_D = \frac{r_D D'(r_D)}{D(r_D)}$$

The profit maximizing interest rate margins of the banks are

$$\frac{r_L^* - (r + C'_L)}{r_L^*} = \frac{1}{\varepsilon_L(r_L^*)}$$

$$\frac{r(1 - \alpha) - r_D^* - C'_D}{r_D^*} = \frac{1}{\varepsilon_D(r_D^*)}$$

Main results:

1. If $C(D, L)$ is additive, i.e. the cost of loan supply and deposit collection are "independent", the profit maximizing interest rate margins on loans and on deposits are independent from one another.
2. Changes in the money market interest rate pushes up both r_D^* and r_L^* . Hence, in this representation of bank's behavior, we see that the transmission mechanism of monetary policy can be very simple as intermediated interest rates respond mechanically to the money market interest rate.

Main short-comings:

1. Ignores credit risks and information asymmetries. Stiglitz and Weiss (1981) apply contract theory/adverse selection to introduce the notion that higher interest rate may deteriorate the average quality of borrowers. At very high interest rates you risk attracting only borrowers who anticipate they are unlikely to repay you. The "interest rate" on loan may hence turn out not market clearing. (a point we will see in lecture 6). An interesting exercise, and potential exam question, would consist of introducing credit risks in the Monti Klein model.
2. Banks themselves may take too much risk. This is one motivation for capital requirements, liquidity requirements (in addition to required reserves) and other bank regulation/supervision. (a point we will see in lecture 7)

5.4 Central banks balance sheet policy since Lehman

5.4.1 The balance sheet of the ECB in 2006 and 2012

The ECB has assumed an intermediation role that the interbank market had lost.

5.4.2 Interpretations of the balance sheet policy (Keister-Mc Andrews)

The Fed (and the ECB) increase the supply of public liquidity when the provision/acceptability of private liquidity collapse.

(complementary readings: Holmstrom and Tirole 's Private and Public supply of liquidity; Brunnermeier and Sanikov 's The I theory of Money)

5.4.3 Exercise for 8 February:

1. Read and study Keister and Mac Andrews. Why are the Fed asset purchases and the ECB supply of liquidity to the banking system different? Why are they equivalent?
2. Find the latest available balance sheet of the ECB and compare what it was in 2006 and 2012 as included in these lecture notes.
3. Define the Targeted LTROs that the ECB introduced in June 2014? What measures did the ECB decide in September 2014, in January 2015 and December 2015? In what sense could these additional measures "compete" with the Targeted LTRO? In what sense, through which mechanism can they re-inforce such measures?

Normal times					
Bank A			Bank B		
assets		liabilities	assets		liabilities
Reserves	10	Deposits	100	Reserves	10
Loans	50			Loans	130
Due by bank B	40			Due to bank A	40
Securities	10	Capital	10	Securities	10

Central bank intermediation type I, eg VLTROs					
Bank A			Bank B		
assets		liabilities	assets		liabilities
Reserves	50	Deposits	100	Reserves	10
Loans	50			Loans	130
				Due to ECB	40
Securities	10	Capital	10	Securities	10

Central bank intermediation type II, QEs/LSAP/SMP/TA??

The central bank acquires 40 of securities by issuing money

Central bank intermediation type II, QEs/LSAP/SMP/TA??					
Bank A			Bank B		
assets		liabilities	assets		liabilities
Reserves	90	Deposits	140	Reserves	10
Loans	50			Loans	130
				Due to ECB	40
Securities	10	Capital	10	Securities	10

Figure 5:

Eurosystem balance sheet main items (30 November 2012, billions euros)

Assets		Liabilities	
Gold	479	Banknotes	889
		Owed to euro area credit institutions	937
Forex reserves non residents	259	Owed to other euro area resider	180
Forex reserves residents	36	Owed to non EA residents	176
Lending to EA credit institutions	1131		
<i>Main refinancing operation</i>	<i>75</i>		
<i>Longer term RO</i>	<i>1040</i>		
Other claims in EA CI	233	revaluation account	452
Securities of EA residents	586	Capital and reserves	85
<i>inc for MP purpose</i>	<i>277</i>		
Sub Total	3839	Sub Total	2719
other stuff	-806	other stuff	314
Total	3033	Total	3033
nominal GDP = about 9450 billions			

Eurosystem balance sheet main items (1 December 2006)

Assets		Liabilities	
Gold	174	Banknotes	601
		Owed to euro area credit institutions	184
Forex reserves non residents	147	Owed to other euro area resider	44
Forex reserves residents	24	Owed to non EA residents	16
Lending to EA credit institutions	428		
<i>Main refinancing operation</i>	<i>307</i>		
<i>Longer term RO</i>	<i>120</i>		
Other claims in EA CI	9	revaluation account	124
Securities of EA residents	79	Capital and reserves	64
<i>inc for MP purpose</i>	na		
Sub Total	861	Sub Total	1033
other stuff	265	other stuff	93
Total	1126	Total	1126
Euro area GDP nominal in 2011	9420		
MFI consolidated balance sheet	27254		
MFI loans to Private sector	11168		

Figure 6: