

5. The Central Bank as a Clearinghouse

Today we start to get a little more specific about one of the two central themes of the course, banking as a clearing system. We begin with the idea of payment as a balance sheet operation within the banking system, and the observation that, if the banking system were one big bank, there would be no need for reserve flows. **One way to understand the evolution of the banking system is as an attempt to make the system operate as if it were one big bank.**

One Big Bank

Suppose there was only one bank, and everyone in the economy had an account. So the balance sheet might look like this:

Bank A	
<u>Assets</u>	<u>Liabilities</u>
Reserves	Deposit account α
	Deposit account β

In this world it is natural to think of the “quantity of money” as the quantity of deposit accounts at the bank. Payments made by any depositor in A to another depositor in A simply subtract and add the same number on the liability side of the bank balance sheet; reserves never move. The only drawback of the Bank A system is that you have to have a positive account in order to make a payment. It’s a money payment system, not a credit payment system.

But there is really no reason to insist on that. A more general form of one-bank banking would allow overdrafts. Negative deposit accounts show up on the asset side of Bank B.

Bank B	
<u>Assets</u>	<u>Liabilities</u>
Overdraft γ	Deposit account α
Overdraft λ	Deposit account β

This innovation has a somewhat startling implication. Note that if γ makes a payment to α , that involves an expansion of both sides of the bank’s balance sheet, in effect an expansion of credit. Contrariwise, if β makes a payment to λ , that involves a contraction of both sides of the bank’s balance sheet, in effect a contraction of credit. The use of bank credit as a means of payment thus involves a certain elasticity in the quantity of money.¹

¹ Note in passing that this way of thinking about the payments system raises deep questions about how properly to measure the money supply. Consider three possibilities:

- (1) Σ deposits, but this measures only those with positive balances
- (2) Σ (deposits – overdrafts)
- (3) Σ (deposits-credit limits)

Let us tally up the effect of different payment flows on the size of the balance sheet of Bank B.

	α	β	γ	λ
α	0	0	-	-
β	0	0	-	-
γ	+	+	0	0
λ	+	+	0	0

Multiple Banks

But of course there isn't just one bank, and that causes problems. To see the problem, think of a world with two banks.

Bank A		Bank B	
<u>Assets</u>	<u>Liabilities</u>	<u>Assets</u>	<u>Liabilities</u>
Reserves	Deposit account α	Reserves	Deposit account γ
	Deposit account β		Deposit account λ

The problem occurs when someone with an account in Bank A wants to make a payment to someone in Bank B. One way for this to happen is for Bank A to transfer reserves to Bank B. The effect is to shrink the balance sheet of A and expand the balance sheet of B. But if this is how payment actually takes place, we lose almost all the advantages of banking. It's almost as if people are making payments with the gold reserve. There is a better way.

Instead of transferring reserves for each order of payment, suppose that each day each bank collects "due tos" and "due froms" with respect to every other bank.

Bank A		
<u>Assets</u>	<u>Liabilities</u>	
Due from A	Due to A	zero
Due from B	Due to B	Net to B
Due from C	Due to C	Net to C
Due from D	Due to D	Net to D

At the end of the day, each bank nets the payments to each other bank and pays only the net in gold. Call this "bilateral intraday netting". This clearly involves less gold transfer than the first system, but there is a better way yet.

Suppose, for example, that over time net payments to B tend to average out. Then it makes no sense to move gold every day that is just going to move back. Instead it is more

The ambiguity about how to measure money in such a world led Fischer Black to propose that we not try. See Black "Banking in a World without money" (1971)

efficient to transfer virtual gold, by transferring “correspondent balances”. Thus, if A owes B, A can pay B by drawing on balances held at B, or by increasing the balance held at A to B’s credit.

In general we can think of correspondent balances as beginning with a simple swap of IOUs between Bank A and Bank B:

Bank A		Bank B	
Assets	Liabilities	Assets	Liabilities
+deposit at B	+deposit from B	+deposit at A	+deposit from A

Then we use debits and credits to these accounts as a way of making the interbank transfers involved in payment between customers of Bank A and Bank B. Logically there are two possibilities:

Case 1: Correspondent Balances held at B are debited

Bank A		Bank B	
<u>Assets</u>	<u>Liabilities</u>	<u>Assets</u>	<u>Liabilities</u>
Reserves	-Retail Deposits	Reserves	+Retail Deposits
-Deposit at B			-Deposit from A

Case 2: Correspondent Balances Held at A are credited

Bank A		Bank B	
<u>Assets</u>	<u>Liabilities</u>	<u>Assets</u>	<u>Liabilities</u>
Reserves	-Retail Deposits	Reserves	+Retail Deposits
	+Deposit from B	+Deposit at A	

In the first case total deposits (including interbank balances) fall, while in the latter case total deposits (including interbank balances) rise.

In practice, the choice between Case 1 and Case 2 is always resolved so that the more central bank accepts deposits from the less central. In the US case it was country banks holding deposits with city banks. These reserve cities survive as the cities with one of the twelve Federal Reserve Banks.

The invention of correspondent banking amounts to moving from a money payment system to a credit payment system between banks. Note that, since the correspondent system is a credit system, we are not constrained by the quantity of gold, only by the various bi-lateral credit limits. One can imagine an entire banking system using these book entries to clear bi-lateral net payments at the end of the day. But there is an even better way.

Clearinghouse

In a system of bilateral bank payments, any individual bank may at the same time be making payments to one bank while receiving payments from another. Obviously it would advantageous

to devise a system where the bank only had to pay the net across all its correspondents. One simple way that kind of system develops is when all banks hold correspondent balances in only one bank, and use those balances to clear. You can see how that goes some way toward creating a one-bank payment system. The problem arises when any member bank runs his balance to zero. Elasticity of the payments system requires the correspondent to extend an overdraft, but he might not want to, especially if the demand for overdrafts comes from more than one bank at once.

A better system is the clearinghouse, in which banks of approximately equal stature in the hierarchy come together to form a mutual organization, owned by their members in proportion to capital subscribed. Just so, the New York Clearinghouse Association (now CHIPS). Capital is subscribed in gold or other legal reserve, and determines initial holdings of clearinghouse certificates. Subsequently, members treat all sums due to or from other members as due to or from the clearinghouse. During the day all members net payments multilaterally with all other members, building up intraday credit or debit balances against the clearinghouse. At the end of the day each member makes or receives only a net payment, depending on whether the net is negative or positive. Settlement involves transfer of clearinghouse certificates, which may require prior bi-lateral borrowing between deficit banks and surplus banks.

NYCA	
Assets	Liabilities
Gold (Security)	Clearinghouse Certificates (owned by A, B)
Intraday net due from A	Intraday net due to B

The advantage of the clearinghouse is that all members guarantee all payments. The entire capital is available to make good on the negative clearing of a member in case the member itself cannot. If A cannot pay, then all the members pay in proportion to their capital subscription. Of course no one wants this. The clearinghouse policy committee therefore tends to be given wide powers to help individual banks, lending from the CH or coordinating accommodation through other banks.

Of particular interest is what happens in a financial crisis, when all member banks find themselves short of gold, because of outflows into circulation or abroad. Then there is no chance of solving the problem by arranging for weak banks to borrow temporarily from strong banks. Instead, weak banks borrow from the clearinghouse, which creates additional reserves from thin air simply expanding both sides of the balance sheet.

Assets	Liabilities
Gold (Security)	Clearinghouse Certificates
Member loans (6%)	CH Loan Certificates (6%)

In effect, what happens is that intraday deficits and surpluses are not paid but rather put off to another day. Typically these member loans are highly overcollateralized, and pay interest of 6%.

Similarly the CH loan certificates pay interest of 6%. The loan certificates are not gold, and so are not strictly speaking legal reserves, but in a crisis they come to be treated as similar to the clearinghouse certificates which are gold and are legal reserves. After the crisis they are liquidated.

Central Banking

Central banking can be understood as nothing more than one step beyond the clearinghouse, a kind of regularization and strengthening of the clearinghouse system that goes the extra step of obliterating the difference between clearinghouse certificates and clearinghouse loan certificates.

<u>Assets</u>	<u>Liabilities</u>
Gold	Deposits
+Discounts	+Currency

As we will see next time, the correspondent balance system was replaced by the Fed Funds market in which deficit banks could borrow from surplus banks anywhere in the system, not just their correspondents.

Clearinghouses can be broken by any individual member who insists on redeeming clearinghouse notes for gold. Central banks by contrast cannot be broken by internal forces because their own liabilities are the member banks' reserves. In effect, the central bank makes the system of banks operate as though it were a single bank because they all have clearing accounts at a single bank. All payments from someone within the system to someone else within the system net out. There is however still the problem of managing relations with the rest of the system and this problem is the origin of the "Art of Central Banking"

Two kinds of problem arise. It may be that the bank customers demand payment, so reserves flow out of the banking system into circulation as customers demand currency. This is called an internal drain. A more difficult problem is an external drain, where foreigners demand payment in gold.