

11. Banks: The Market for Liquidity

Last time we introduced the concept of a continuous or liquid market, and argued that the institution of a dealer is key to achieving a liquid market. The dealer supplies market liquidity by quoting prices to buy and sell, and absorbing the resulting order flow onto his balance sheet. The consequent positions, long and/or short, have to be financed somehow, which means that the dealer is a demander of funding liquidity.

Today we ascend the hierarchy and consider banks as dealers. Way back at the beginning of the course, I said we would be thinking of the banking system as making markets by being prepared to trade currency for deposits and vice versa, at a fixed price par. When we try to apply the Treynor model directly to banks in this sense, we immediately confront a puzzle. This is clearly a limiting case, in which the spread is zero and the price is fixed, and from what we know about dealers this kind of restriction makes such dealing both impossible and unprofitable.

Instead of confronting this puzzle head-on, let's start from what we already understand. Let's start by thinking of security dealers as banks.

The Treynor model focuses attention on the net position of the dealer, because he is mostly concerned about price risk. However, if we want to understand banking, we need to bring into the picture the gross position as well, which is an order of magnitude larger. Here is a stylized balance sheet, dividing the dealer's balance sheet into two pieces.

	Assets	Liabilities
Matched book dealer	Securities in, 100	Securities Out, 100
Treynor "speculative" dealer	Net financing, 10	Loans, 10

The matched book part is comprised, in principle, of equal and opposite long and short positions, so that fluctuation in security prices have exactly offsetting effects. Only the speculative book is exposed to price movement, and it is an order of magnitude smaller than the matched book. I am showing the dealer as net long, and funding this net long position with loans. The data for primary dealers in the US shows their outright position, but not necessarily their actual exposure since it does not include derivative positions, so we cannot exactly translate between the conceptual distinction and the data.

Security Dealers as Money Dealers, Term Rates

The data does however show in some detail how all these positions are financed, and it is instructive to look at closely. The data below is from October 3, 2012, Table 4 in the dealer statistics: <http://www.newyorkfed.org/banking/reportingforms/primarystats/deal.pdf>

	Assets	Liabilities
	854 overnight reverse 1253 term reverse 515 net financing	1796 overnight repo 826 term repo

Note that I have added net financing as a balancing item, since borrowing is greater than lending. Net financing is not the same as the outright positions shown in Table 3 (which add to about 270), and one reason is the way that mortgage backed security positions are treated. We don't have to worry about that, since we are trying to understand concepts.

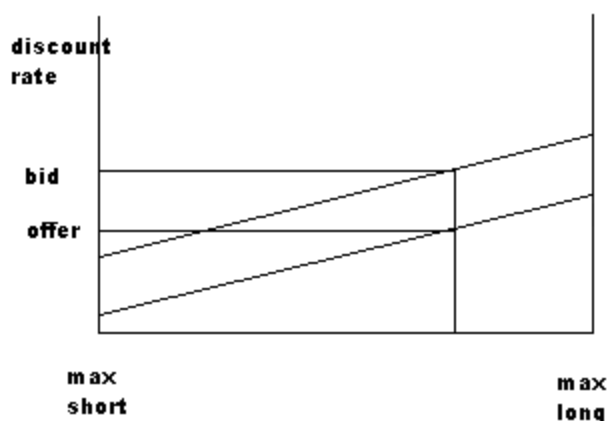
I have made the point before that security dealers operate somewhat like banks, insofar as they are borrowing short term and lending long term, which you can see in the data. Now I want to go farther using our idea of matched book. Suppose that the term of reverse lending and reverse borrowing are exactly the same. Then we can rewrite the dealer balance sheet as follows

	Assets	Liabilities
Matched book dealer	854 overnight reverse 826 term reverse	854 overnight repo 826 term reverse
Treynor "speculative" dealer	427 term reverse 515 net financing	942 overnight repo

In fact we can go farther still, by distinguishing two different kinds of price risk on the speculative dealer side. Just add 515 term repo on the liability side and 515 term reverse on the asset side

	Assets	Liabilities
Matched book dealer	854 overnight reverse 826 term reverse	854 overnight repo 826 term reverse
Treynor "speculative" dealer	942 term reverse 515 net financing	942 overnight repo 515 term repo

So the dealer has 515 exposure to security price risk, and is funding that exposure using term repo. That's the risk we talked about last time. But he also has 942 exposure to liquidity risk, borrowing short and lending long in the money market. That is new, but we can adapt the Treynor model to handle it.



Since here we are talking about the money market, prices are quoted as yields, so the bid is higher than the offer and the dealer quote curves slope up rather than down. But the same idea applies, that the dealer is willing to take on more risk, in this case liquidity risk, only if compensated by higher expected return, in this case the difference between the term rate and the overnight rate. (I label the vertical axis as discount rate to remind us of our discussion of the world that Bagehot knew, where the discount rate was a term rate. For now think of the overnight rate as fixed by the Fed's official Fed Funds target.)

The point to emphasize here is that the security dealer chooses not only how much price risk to take (and chooses price quotes to achieve that) but also how much liquidity risk to take (and chooses yield quotes to achieve that). The balance sheets show clearly that, if the dealer wanted to, he could take either less or more liquidity risk than price risk—the two numbers do not have to be the same.

Now let's translate all this into banking language. Overnight repo is analogous to a demand deposit account, and term repo is analogous to a short term loan. So our Treynor diagram is not just about the determination of term repo rates, but also about bank term rates as well. Banks make money, in part, by issuing money as their liability and investing the funds they receiving in interest bearing securities. That is exactly what the dealers are doing as well.

Digression: The Evolution of Banking

It will be helpful when reading Stigum to have in mind the traditional picture of banking that she would have learned when she was in school. In this picture, a bank is an institution that makes loans to corporate customers and takes deposits from households retail. These are essentially passive activities. Where the action comes is in managing the difference between these two. If lending exceeds deposits (as is typical for money center banks) then they must raise

additional funds in the money market. If deposits exceed lending, then they must find profitable outlets for excess funds, typically some money market asset or longer term security.¹

This traditional view sees banks as intermediaries between savers (household depositors) and investors (corporations). All the money market does is to move those deposits from banks with excess to banks with deficit, so in the aggregate what is happening is that deposits are funding loans. Banks are intermediaries that facilitate that movement, and also intermediaries in the sense that borrowers and lenders both face the bank, not each other. In this traditional view, banks are important mainly because of their role in fostering capital accumulation.

Corporations		Banking System		Households	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
	Loans	loans	deposits	deposits	
		securities	borrowing		
		reserves	capital		

This is a pretty good picture of what things looked like in the fifties. One thing it leaves out is that government securities were a large portion of bank portfolios, so that much expansion of lending was replacing government securities with private loans. (As you read you will note a lot of ways in which government securities are given privileged legal status. The government in time of war uses the banking system to support the market in its debt.)

Things have however changed. Stigum talks about the “Death of loans”--top corporate customers have access to open market credit, particularly commercial paper, where they can borrow more cheaply than banks. Banks have adjusted to the loss of this business by instead providing backup lines of credit to commercial paper issues.

The second big change I would call the “Death of deposits”. Reg Q worked to provide banks with low cost funds by limiting interest payment on deposits, but this eroded over time. Rise of money market mutual funds as competitors. So-called “disintermediation” as ultimate borrowers and lenders began to take interest rate risk, without the bank standing between them.

Finance Companies

MMMFs

Assets	Liabilities	Assets	Liabilities
Loans	Commercial Paper	Commercial Paper	MMMF shares

See data at <http://www.federalreserve.gov/releases/z1/Current/>
MMMFs are table L.121, Finance Companies are table L.127

¹ There is also the matter of managing interest rate risk and liquidity risk. See Stigum and Branch Managing Bank Assets and Liabilities: Strategies for risk control and profit (1983).

As Stigum was writing, banks were losing their core business, but at the same time being prevented from going into any others. The Securities Industry Association (SIA) resists bank attempts to get into underwriting non-exempt securities. The Fed imposes capital adequacy regulations on banks that are not imposed on others. This accelerates the tendency to strip the balance sheet, to go for off-balance sheet exposure, substituting FRA for deposits, futures for actuals, etc....

This apparent discrimination against the banks was also in part motivated by concerns about safety and soundness of the payment system. Also the fact that banks, unlike their competitors, have privileged access to the Fed, and the Fed wants to keep use of that access to a minimum.

In the last ten years or so we have seen a further development of this parallel banking system, into what now people call the shadow banking system. Essentially we seem to be moving from a system of bank credit to a system of capital market credit. Corporations pioneered in this shift, but the latest development has notoriously been more about household credit, namely mortgage credit.

Households		Shadow Bank		MMMF	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
	mortgage	RMBS	MM funding ABCP RP	ABCP RP	Shares

The shadow banking system faces the same problems of liquidity and solvency risk that the traditional banking system faced, but without the government backstops (mainly Fed LOLR and FDIC deposit insurance). Instead the shadow banking system relies on the market for both, the wholesale money market and the CDS market mainly.² We will focus on liquidity risk and hence the wholesale money market.

Overnight Rates—Fed Funds

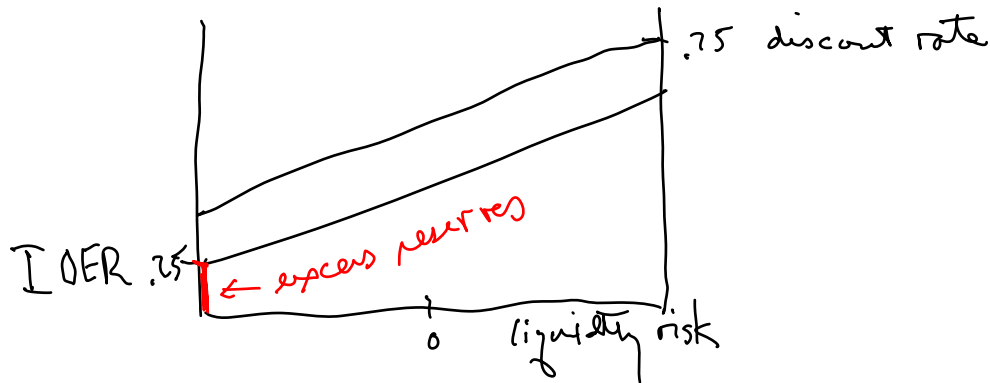
We turn now to the question of the overnight rate, which we have so far treated as though it were pegged by the Fed. The full story is more interesting. In fact what the Fed is now doing essentially two different things—it is fixing the outside spread, and it is (or was anyway before the crisis and presumably will be again at some future moment) trading in the repo market to influence the supply of reserves. (Remember that Fed Funds are overnight promises to pay reserves.)

Outside spread. Interest on reserves is currently .25, and the discount rate is currently .75. These are essentially an outside spread. It is a pretty narrow outside spread (only 50 basis points), and the Fed's communication makes clear that it anticipates widening that spread in the future. The

² The lender of last resort to the shadow banking system is the traditional banking system, operating through various lines of credit and liquidity support commitment.

interest on reserves, in particular, it imagines will be 75 basis points below the target. And before the crisis, discount rate was 100 basis points above the target. At the moment the effective funds rate is actually below IOER rate (16 bp vs. 25 bp), but that is because there are some lenders in the market who are not eligible to receive interest on reserves, and there are lots of excess reserves, so they have to take what they can get. In a way, we should think of the effective FF rate as 25, not 16, and that helps us a bit to understand why repo rates are higher than FF. A lot of distortion in the system right now.

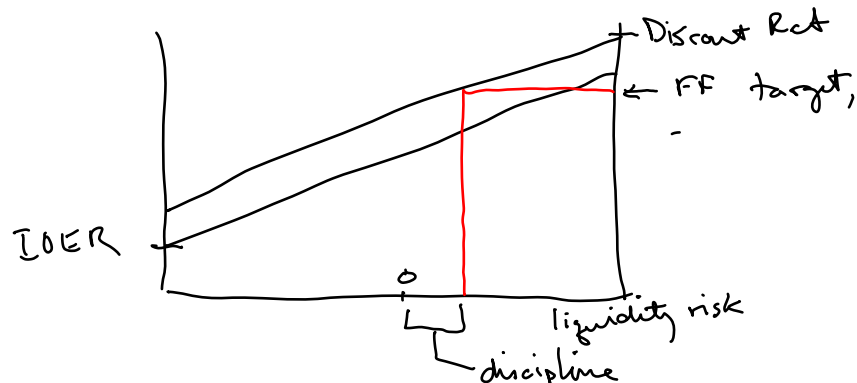
That said, we can use the Treynor diagram to understand what is happening:



In this situation clearly the Fed can just establish the FF rate as IOER. In the future however, it intends just to set the outside spread and then perhaps influence the level by trading. Just so, recall how temporary open market operations work:

Bank		Dealer		Fed	
A	L	A	L	A	L
+reserves	+deposit		+repo	+repo	+reserves
-loan			-loan		

Here I am showing the dealer using the Fed's loan to pay off bank loan. (Before I showed it used to accumulate a deposit.) The result is that the Banking system as a whole now has more reserves, which should ease some of the need to borrow reserves and hence lower the effective funds rate. The point is to keep the FF rate near the target by intervening daily. The outside spread is intended only for anomalous situations for individual banks.



So now we can return to the puzzle we started with—how do banks manage to make markets in currency and deposits at a zero bid-ask spread and a price that is fixed at par, and how do they make profit doing so? The answer is that they are also in a complementary business, the business of bearing liquidity risk by issuing demand liabilities and investing the funds at term, and this business is highly profitable. They cannot change the price of deposits in terms of currency, but they can expand and contract the quantity of deposits because deposits are their own liability, and they can expand and contract the quantity of currency because of their access to the discount window at the fed. Security dealers are stuck with the quantity of securities out there, and stuck also with the quantity of cash out there. Banks are not stuck with the quantity of deposits or currency, so although they have less flexibility on price, they have more flexibility on quantity.

Term Rates, Redux

In normal times, the Fed targets overnight rates, leaving term rates to be determined in the market. But during the crisis the Fed did a lot of intervention in term markets, which broke down, mainly lending. And now the Fed is experimenting with intervention on the other side of the market, by issuing term deposits of its own, first time Sept 10, 2012.

http://www.frb services.org/files/centralbank/pdf/termdepositfacility_offeringresults_A26_091012.pdf

We can see the consequence for the Fed's balance sheet:

<http://www.federalreserve.gov/releases/h41/Current/>

What is the Fed trying to undo? Topic for next lecture.

http://www.newyorkfed.org/markets/Forms_of_Fed_Lending.pdf