Material for paper 1

This document tells you things I would have told you in class.

VII) The central bank: introduction

E) Reserve accounts

3) How banks clear checks and other payments using their reserve accounts

Banks make payments to other banks. Say you pay your rent with a check for $500. Your landlord gives the check to his bank - say, Citibank. Your landlord's bank gives the check to *your* bank - say HSBC - and says "pay me." HSBC pays Citibank $500 by sending the Fed a message: "Take $500 out of the HSBC reserve account, transfer it to Citibank's reserve account." (And, of course, your landlord's bank credits his checking account with $500; your bank debits your checking account $500.)

Note that a transfer from one bank's reserve account to another bank's reserve account does not affect the *total* quantity of reserves.

In the same way, banks use reserve accounts to make payments to, or receive payments from, the Federal government. Like a bank, the U.S. Treasury has an account in the Federal Reserve system. The Treasury's account at the Fed is not called a reserve account, but otherwise it is the same. Say you pay your income tax with a $500 check or electronic payment. Your bank's reserve account is debited $500; the U.S. Treasury's Federal Reserve account is credited $500. Say your grandmother gets a Social Security payment of $1000. Her bank's reserve account is credited $1000; the Treasury's Fed account is debited $1000.

4) What affects total reserve supply

"Reserve supply" means the total dollars in all banks' Federal Reserve accounts. The balance in the U.S. Treasury's account at the Fed is *not* part of reserve supply. What changes reserve supply?

a) Payments to/from the U.S. Treasury

Because the U.S. Treasury's reserve account is NOT part of total reserve supply, a payment from a bank's reserve account to the treasury's account reduces reserve supply; a payment from the Treasury's account to a bank increases reserve supply.

b) Open market operations

i) Fed buys stuff

Say the Fed buys a bond from you, in an open-market operation, for $1000. The Fed gives you a check. You deposit the check in your bank. Your bank gives the check to the Fed and says "pay me." The Fed adds $1000 to your bank's reserve account. (And, of course, your bank credits your checking account with $1000.)

It doesn't matter that the Fed bought a bond, specifically.

ii) Fed sells stuff

Opposite of i).

c) Changes in public's demand for cash

Say the public wants to hold more cash. People withdraw cash from their checking accounts. The bank needs to replenish its ATMs. To get cash, a bank gets the cash from the Fed. The value of the cash is deducted from the bank's reserve account.

Thus, when the public's demand for cash increases, that tends to reduce total reserve supply.

Of course, the whole thing works in reverse: when the public's demand for cash falls, that tends to increase reserve supply.

d) LOLR operations.

See below.

XIII) The central bank as lender of last resort (LOLR)

A) Review: liquidity crisis

Remember the situation that creates the possibility of a liquidity crisis: a financial intermediary (FI) is borrowing short-term (e.g. taking deposits) to acquire illiquid assets (e.g. make loans). The value of illiquid assets is high if you can hold them while they pay off, or sell them off slowly. Their value is low if you must sell them fast in a fire sale.

A liquidty crisis is set off when the short-term lenders to the FI withdraw their short-term loans (e.g. when depositors in a bank withdraw their deposits) - when they "run."

If the fire sale does not have enough lquid assets to cover the withdrawals, it must fire sale its illiquid assets, which makes it insolvent; it can't get enough from fast sale of the illiquid assets to pay off all the lenders to the FI

Recall also the idea of contagion to other FI's. An FI in trouble withdraws short-term loans it made to other FIs. An FI's sales of illiquid ssets in a fire sale depresses their prices, endangering the solvency of other FI's holding the same types of assets.

B) How a central bank can help

1) Introduction

General idea: block liquidity crises by making it unnecessary for a run-on FI to sell illiquid assets in a fire sale.

2) Buy illiquid assets from FI in trouble

A central bank can buy illiquid assets from a FI suffering a run, not at low fire-sale prices, but at the higher prices one can get if one has lots of time to sell the assets. The FI then has enough money to pay off lenders to the FI. The central bank does fine too: it can simply hold onto the illiquid assets as they pay off. Or it can sell them slowly at high prices.

3) Make loans to FI in trouble, taking illiquid assets as collateral

This also gives the FI cash to pay off lenders to FI. The FI keeps ownership of the illiquid assets; the central bank doesn't have to take them over. Especially good if the assets we're talking about are loans. The holder of a loan must do the monitoring and restrictive covenants. A central bank doesn't want to mess with that.

If everyone knows the central bank will do these things, maybe there won't be runs on FI's in the first place!

Doing 2) and 3) are both called "acting as lender of last resort." Why isn't it called "acting as illiquid-asset-buyer-of-last-resort? Because central banks *usually* do 3).

C) LOLR best practice: Bagehot's rules

1) Introduction

Walter Bagehot, pronounced badge-it (rhymes with gadget), was the editor of a British business/finance magazine (*the Economist*, still around today), sort of the British *Wall Street Journal*, in the middle of the 19th century. He wrote about what the Bank of England did in liquidity crises. What the Bank was doing

was acting as lender of last resort. Bagehot said: “what the Bank ought to do is this...” His recommendations are now called “Bagehot’s rules” for being a good LOLR.

2) Distinguish between illiquidity and ordinary insolvency

An FI is in trouble. Do you, the central bank, help it by buying its illiquid assets or taking the illiquid assets as collateral for a loan to the FI?

Bagehot said, *do not* help it if its problem is ordinary insolvency due to defaults on its assets or interest-rate risk. Such FI's should be left to die, so that FIs have incentive to not acquire too-risky assets.

Do help the FI if it would be solvent except for the liquidity crisis/fire sale problem.

3) Charge a penalty rate for LOLR loans

“Penalty rate” means higher-than-normal interest rate. You want the liquidity crisis to cause the FI some pain, but not to kill it. This gives FI’s incentive to avoid liquidity crises as much as possible.

D) A problem in LOLR lending: stigma

1) Definition

Central banks want an FI suffering a run to come for LOLR help early, before many of the lenders to the FI have run. "Stigam" can prevent an FI from taking LOLR help.

Stigma is a word that generally means “a mark of shame.” (Its original meaning was one of the nail holes in Jesus’ hands; plural stigmata. Greek.)

In this context stigma means: if people see a FI taking a loan from a central bank, they will fear the FI is on the edge of illiquidity/insolvency and the run on the FI will intensify, making things worse.

FI's fear this will happen. So FI’s might not come to the central bank for help early, when a run is just starting; they wait until the last minute, or when it is too late to save the FI.

2) Something that makes the problem worse: publicizing who borrows

You need to keep it secret who has borrowed from the central bank, if you can. Believe it or not, Congress has twice passed laws requiring the Fed or other federal agencies acting as LOLR to PUBLISH the identities of borrowers.

E) Operations to maintain liquidity of bonds or bills

This is not really what we call LOLR, but it is related.

There can be self-fulfilling expectations, multiple equilibria in whether a class of bond is liquid or not.

If everyone thinks the bond will be liquid in the future, everyone is willing to buy that type of bond. It's liquid.

If people think the bond may become illiquid, they won't buy it. And it's illiquid!

A central bank can push things toward the good outcome (keeping that class of bond liquid) by promising to buy the bond from anyone who wants to sell it to the central bank, at a non-fire-sale price. If everyone knows the central bank will do this, they are willing to buy the bond themselves. And the bond remains liquid.

F) Lending to nonbanks

1) To nonbank FI's

Many types of businesses other than banks act as financial intermediaries, borrowing short-term to acquire illiquid assets. These businesses can suffer liquidity crises just like banks. Central banks need to be able to do LOLR stuff for them.

2) To non-FI businesses

In extreme conditions (1934, 2008), the Fed has made direct loans to ordinary companies, or has bought bills directly from private companies issuing bills. The Fed did this to give those companies a source of

lending when banks were not functioning/ private investors were unwilling to buy the bills (because the private investors feared the bills would not be liquid).

G) Reviving banks and other FIs after a big crisis

1) Aftermath of a big crisis

We want people to start lending to FIs again (e.g. deposit in banks), so that the FIs can make loans to businesses that are unable to sell bonds.

But in the wake of a widespread crisis, some FIs will be insolvent; some will be barely solvent; some will be very solvent.

Potential lenders to FIs (e.g., people who had withdrawn their deposits from banks but could now put money back into banks) don't know which FI's are in which category, and thus are unwilling to lend to any FI's.

2) Solvency testing and certification

To solve this problem, the central bank or another government authority can send agents to inspect FI's accounts, close down the insolvent ones, reopen the very solvent ones, and recapitalize the barely-solvent ones. But what does "recapitalize" mean?

3) Recapitalization

This is when the government authority forces barely-solvent FIs to sell shares to new part-owners. The funds the FI raises by selling shares are used to buy assets. The FI's capital increases (look back at your notes on "capital"). The owners of the FI might be reluctant to raise capital this way, because selling shares - raising capital - reduces existing owners' shares of profits. So sometimes an FI must be *forced* to do this.

Sometimes a government authority wants to save and recapitalize a FI, but private investors are unwilling to buy new shares in the FI. Sometimes in cases like that (again, 1934 and 2008) government authorities have themselves bought shares in FIs to boost the FIs capital. Then the government auhority holds on to

the shares, taking its share of the profits, until private investors are willing to buy the shares from the government authority.

H) LOLR operations increase reserve supply

Recall that when the central bank buys something, that increases reserve supply. So central bank purchases of illiquid assets, or purchases of shares to recapitalize FI's, increase reserve supply.

So do central bank loans to FI's.

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