

Econ 450 Hanes Spring 2020 Paper 1

Paper 1 - exact topic to be assigned later - will be about the financial crisis of 2008 and the Fed's response to it. This document lists the readings relevant for paper number 1 and gives background information to help you understand the readings. The most closely related lecture notes are those posted on my website labeled "Things I would have told you in class." The relevant readings are (numbered as in the coursepack):

15) The Economy: Crisis and Response

16) Bagehot's Dictum in Practice: Formulating and Implementing Policies to Control the Financial Crisis

17) Reflections on a Year of Crisis

18) The Lender of Last Resort Function in the United States

I suggest that you start by reading 15), which you will not entirely understand. Then read the **Background Information** below. Then read 15) again. Then read 16) - 17).

Background information

q.v. means "this term is defined elsewhere in the document."

Asset-backed commercial paper (ABCP)

This is a type of commercial paper (*c.v.*) issued by a structured investment vehicle (*q.v.*) to fund purchases of long-term securities, often asset-backed securities (ABS) (*q.v.*) such as mortgage-backed securities (MBS) (*q.v.*).

Asset-backed security (ABS)

Same thing as a mortgage-backed security (*q.v.*) except that the loans pooled together to make the payments on the bond - "securitized" - are not mortgage loans but rather car loans, or student loans, or credit-card debt, or.... Think of a new kind of debt to make into ABS and you can live on the Upper East Side and buy your kid's way into Princeton!

Commercial paper (CP)

This is a bill issued by a private company. (Bills issued by the Federal government are called "Treasury bills.") A company can issue commercial paper for any reason. It might use the money to purchase inventories or raw materials. It might use the money to purchase long-term assets, in which case it would be a "structured investment vehicle" (*q.v.*) and would be engaging in financial intermediation.

Conduit

As you know, many types of FIs, including banks, are subject to regulatory capital requirements. Simplifying a bit, they are required to hold capital greater than or equal to a certain percentage of their assets. This is to prevent the FI from funding purchases of risky assets *entirely* with new borrowing - if it did, a small drop in the value of the assets would make the FI unable to pay off its borrowing. FIs try to

find ways to get around capital requirements, because funding assets entirely with borrowing is very profitable (though dangerous for the lenders to the FI). One way a FI can get around capital requirements is to set up a conduit. A conduit is, technically, a company separate from the FI setting it up. If the conduit goes bankrupt, the FI loses its investment in the conduit, but the FI isn't responsible for paying off the lenders to the conduit. (There are other ways the term "conduit" is used in financial markets, but this is the meaning that was most important in the 2008 financial crisis.) One type of conduit is a structured investment vehicle (q.v.).

Credit risk

Default risk

Deposit insurance

In order to prevent runs of deposits from banks, in 1933 the Federal government established a government-owned corporation, the Federal Deposit Insurance Corporation, that insures deposits in banks. If your bank becomes insolvent and defaults, your deposits will be paid off by the F.D.I.C. In the 2008 financial crisis, there were practically no runs on bank deposits, except for special types of deposits that don't have F.D.I.C. insurance. There were lots of runs on other types of short-term loans to banks.

Discount lending, discount window

This is a phrase used to refer to *any* kind of lending by the Fed, including (but not limited to) overnight loans to cover overdrafts in banks' reserve accounts, and LOLR lending (which is usually longer-term than overnight). Fed loans are said to go "through the discount window." These phrases exist for historical reasons you needn't worry about.

At the time the 2008 financial crisis hit, the law governing the Federal Reserve system (the Federal Reserve Act) said the Fed could ordinarily lend *only* to banks, that is businesses that have a "banking charter" that allows them to take deposits. But the Act also specified, in Section 13 (3), that under "unusual and exigent circumstances" the Fed could lend to any type of business. Early in the financial crisis, Federal Reserve policymakers were reluctant to invoke Section 13(3) - they didn't want to scare people. So when they wanted to lend to a non-bank FI, they did it in the following way. They found a cooperative bank. They made a loan to the bank while the bank simultaneously lent the money on to the nonbank FI that the Fed wanted to help. The nonbank FI gave collateral to the bank and the bank gave the same collateral to the Fed. In order to make the bank willing to take part in the operation, the loan from the Fed had to be a "non-recourse loan"(q.v.).

Dodd-Frank Act

This is a federal law passed in 2010 (in response to the 2008 financial crisis, of course) that changed regulation of banks and other FI's, and imposed new constraints on Federal Reserve lending operations ("discount lending").

Haircut

For many loans, the collateral provided by the borrower is a security - a bond, or shares of stock - or a basket of securities. Securities' prices change from day to day, and may fall. Thus, to protect the lender,

the amount of money a lender will provide on security collateral is always less than the market value of the security at the time the loan is made. Suppose bank A lends to bank B. The collateral is a bond with a current market price of \$1 million. If bank A lent bank B \$1 million on this collateral, and bank B defaulted on the loan, bank A would be left holding the bag. So the amount of the loan will be less than \$1 million - say, \$900,000. The difference between the current market value of a security (or basket of securities) and a loan collateralized by that security (or securities) is called a "haircut." In my example, the haircut is ten percent.

Investment banks

In the 1920s, big New York city banks such as J.P. Morgan and Company had a sideline in helping private companies issue bonds and new shares of stock. Sometimes a bank would buy up all (or some) of a company's new stock or bond issue from the company wholesale, then retail the bonds or shares of stocks to investors (taking a markup of course). This is called "underwriting." Helping a company design a bond or stock issue and sell the new security, perhaps through underwriting, is called "investment banking."

In 1933, during the Roosevelt administration, a law (called the "Glass-Steagall Act") decreed that banks (companies that take deposits) could no longer engage in investment banking. That is, a company that took deposits could not do investment banking. The investment banking arms of big New York banks became separate corporations, called "investment banks." J.P. Morgan's investment banking business became an investment bank called "Morgan Stanley." Some other investment banks were Goldman Sachs, Lehman Brothers, and Bear Stearns. When I came out of college, investment banks were, like hedge funds today, where smart greedy young people wanted to work. (I hope you are smart and greedy, get a job in a hedge fund, and give money to SUNY-Binghamton once you make your fortune. Not for a baseball stadium, mind. Something useful, please.) Note that investment banks were not really banks. They did not engage in financial intermediation. They did not borrow short-term to acquire illiquid assets.

In the 2000s many investment banks got into the business of securitizing nonconforming mortgages. In doing so, they held the MBS securities that they made out of nonconforming mortgages on their own books while they were selling them off to investors.

Investment banks also started doing financial intermediation. They borrowed overnight to buy and *hold* MBS securities (not just hold them while they were retailing them to investors). They borrowed overnight through "repos" (q.v.) collateralized by the MBS.

Many investment banks were also "primary dealers" (q.v.).

In the early part of the 2008 financial crisis, investment banks became banks (or subsidiaries of banks) - they took "banking charters" - so that they could get "discount loans" (q.v.) from the Fed.

Leverage

As you know, a FI buys assets partly with the capital provided by its owners, and partly with borrowed money. The FI profits on the spread between the cost of its borrowing and the earnings on the assets. "Leverage" is a term for the borrowed money, or the process of adding borrowed funds to capital. A FI,

by definition, uses leverage. The more leverage, the more profit for the FI, but the greater the danger that the FI will become insolvent and default on its borrowing (see your notes on "capital").

Maturity transformation

This is what I called "intermediation across maturity."

Money-market mutual funds(MMMFs)

An ordinary mutual fund (*not* a MMMF) is an investment fund which buys stocks, bonds, real estate, or a mix of such assets, and sells shares in the fund. A shareholder in the mutual fund gets quarterly payments equal to her share of the coupon payments on the bonds, or the dividends on the stocks, or the rents on the buildings. If a shareholder sells her share back to the mutual fund company, the shareholder will be paid her share of the current market value of the assets held by the mutual fund. Because the price of the assets might have fallen since she bought her share of the mutual fund, the money that she gets when she sells her shares in the MMMF might be lower than the amount of money she put into the fund originally.

A "money market mutual fund" or MMMF is a mutual fund that mimics checkable deposits in a bank. Its "shares" are sold to investors at a "price" of \$1. The MMMF promises that it will always buy shares back at the same "price" of \$1. In the meantime, the MMMF pays the investor a fixed percentage rate of return on each \$1 share. In effect, this is the same promise a bank makes when it takes a deposit from me - if I put in \$1000, I can always take the entire \$1000 out again and in the meantime I get interest. An investor in a MMMF can also write checks against her "shares" in the mutual fund.

If the MMMF bought long-term bonds, it might find itself unable to pay its investors everything it owes them: the prices of the bonds might fall (interest-rate risk). So MMMFs don't buy long-term bonds. They don't make long-term loans, either (loans are illiquid). MMMFs *only* make very short-term loans, including overnight repos (q.v.), and buy bills: Treasury bills and commercial paper (q.v.).

In the 2008 liquidity crisis, there were defaults (or at least people feared defaults) on the commercial paper held by MMMFs, especially the CP issued by structured investment vehicles (c.v.). Investors in MMMFs "ran" - that is, there were mass withdrawals from MMMFs. MMMFs did not have enough funds on hand to pay everyone. So some funds reneged on their promise to always buy back shares for \$1 - they would buy back shares for only 90 cents, for example. This was called "breaking the buck." It was equivalent to a bank refusing to pay back the entire amount of your deposit.

Mortgages, mortgage-backed securities(MBS), Fannie and Freddie (GSEs)

A "mortgage loan" is a loan used to buy a house (or other piece of real estate) collateralized by the house itself. If the borrower fails to make the specified payments on the loan, the lender has the legal right to seize the collateral, as in any loan. In the case of a mortgage loan, this process is called "foreclosure." A mortgage can be sold, kind of like a bond (but not quite as easily as a bond can be sold). Most mortgage loans are made by banks or companies that specialize in making mortgage loan. Usually, the original lender sells a mortgage very soon after the loan is made.

It is possible to buy insurance on a mortgage. The insurance company will pay off on the mortgage if the borrower defaults.

It is also possible for a company to buy up a lot of mortgages and "package" them into a bond. That is, after buying up the mortgages, the company issues a bond made out of the mortgages. The money that comes in from the interest and principal payments on the mortgages goes to pay the coupon and face value payments on the bond. Such a bond is called a "mortgage-backed security" or MBS. ("Security" is a word that means stock or bond.) The process is called "securitization."

A "conforming" or "prime" mortgage is a mortgage that is structured so that the borrower will almost certainly be able to pay off the mortgage, that is, not default. A conforming mortgage does not cover the full purchase price of the house. That is, if the house costs \$500,000, a conforming mortgage loan is only for \$450,000. The buyer must cover the rest of the house price with her own money (the "down payment"). A conforming mortgage is a "fixed-payment" loan (all payments the same size; final payment is not especially big) and is long-term, typically 30 years. Thus, the monthly payment is predictable and relatively small. Finally, in a conforming mortgage the lender checks the borrower's monthly income to make sure that it can easily cover the monthly mortgage payment.

Many years ago the federal government set up two special corporations, which are referred to as "government-sponsored enterprises" or GSE's. The companies' nicknames are "Fannie Mae" and "Freddie Mac." They buy up insured, conforming mortgages and package them into MBS. The MBS created by Fannie Mae and Freddie Mac are guaranteed by the corporations: if the underlying mortgages suffer lots of defaults and don't actually generate enough money to cover the bond payments, Fannie or Freddie will still pay off on the bond.

In the early 2000s, house prices began rising rapidly, year after year, over nearly all of the country. (Not in upstate New York, but nearly everywhere else.) People came to believe that house prices would keep rising forever. Mortgage lenders became willing to make "subprime" or "nonconforming" mortgage loans. These were mortgage loans where the final payment was much bigger than the other payments ("balloon loans,"), or where the interest payments on the loan were not fixed - they went up if short-term interest rates went up ("floating rate loans"), or where the monthly payment was quite large relative to the borrower's monthly income, or where the term of the loan was very short (as short as five years), requiring the borrower to get another mortgage when the first mortgage came due. Paying off an old mortgage with money borrowed in a new mortgage is called "refinancing." Because lenders believed house prices would rise forever, they did not worry that borrowers would default on such mortgages - if worst came to worst, the borrower could just sell the house for a high price and pay off the mortgage.

Fannie Mae and Freddie Mac would *not* buy nonconforming mortgages to repackage into MBS's. But other companies, including investment banks (q.v.), did. Because people thought there was little risk of default on nonconforming mortgages (because house prices were going to rise forever), they thought there was little risk of default on these MBS bonds. Bond raters like Moody's and Standard and Poor's gave the bonds high (AAA) ratings. And the bonds were frequently sold with credit default swaps attached which insured the bonds against default - assuming the counterparties on the CDS did not default themselves. Because people thought there was practically no danger of default on these MBS bonds, even though they were made out of nonconforming mortgages, they were quite liquid - almost as liquid as Treasury bonds!

In the 2008 financial crisis, people realized that there was high default risk on MBS bonds made out of nonconforming mortgages, and that other people might be better able to judge the default risk - a lemons problem. Thus the prices of these bonds fell a *lot* and the bonds also became very illiquid.

Non-recourse loan

Usually, a loan with collateral is a "recourse" loan, which means that if the borrower defaults on the loan, and the value of the collateral isn't enough to pay off all of the loan, the lender has the right to seize other assets of the borrower to make up the difference. A "non-recourse loan" is one where the lender can seize only the collateral specified in the loan agreement - not any other assets of the borrower.

Primary dealer

If you wanted to buy or sell a Treasury bond, how would you do it? You would probably go to a "dealer" (or "broker/dealer"). This is a business which buys Treasury bonds from people, and from the Treasury when it auctions bonds, and sells bonds at a slightly higher price, making its profit on the spread. Most bond dealers also handle other types of bonds, like MBS and ABS (q.v.). A dealer needs to keep a pretty big inventory of bonds on hand. To pay for the inventory, it uses capital and borrowed money (an example of "leverage", q.v.). Most of its borrowing is through overnight repo (q.v.) loans collateralized by the bonds in its inventory. Thus, a bond dealer is also a FI: it is borrowing short-term (overnight) to finance purchases of longer-term assets (bonds).

A "primary dealer" is a dealer licensed to deal with the Fed when the Fed does open-market operations. Most primary dealers are subsidiaries of banks or (up to 2008) investment banks.

Primary Dealer Credit Facility (PDCF)

In the 2008 financial crisis MBS and ABS bonds became illiquid. Lenders to primary dealers would no longer take the bonds as collateral for repo loans. This was a sort of run on primary dealers. The Fed had to figure out a way to make LOLR loans to primary dealers. It set up the "Primary Dealer credit Facility" to do this.

Repos (repurchase agreements) and "haircuts"

A "repurchase agreement" or "repo" is really a collateralized short-term loan. But it is legally structured as the sale of a bond (or basket of bonds) coupled with a contract for future purchase of the bond. Say Bank A wants to borrow money overnight and holds bonds which it can put up as collateral for the loan. Bank B wants to lend money overnight. So Bank A sells a bond to Bank B on Tuesday for \$900 thousand and simultaneously signs a contract to buy the bond back from bank B on Wednesday morning for a price a little higher than \$900 thousand. The "little higher" is the interest on the loan. The bond itself is the collateral - bank B gets to keep it if bank A defaults on the overnight loan. Lenders apply haircuts (q.v.) in repo loans, so the amount of a repo loan is always substantially less than the market value of the collateral bond (or bonds) on the day the loan is made.

A "tri-party repo" is a type of repo in which the collateral security is held by a third party, rather by the lender, while the loan is outstanding.

Structured investment vehicle

This is a type of financial intermediary that borrows short-term by issuing commercial paper (q.v.). to buy MBS and ABS (q.v.). The commercial paper issued by a structured investment vehicle is called "asset-banked commercial paper" (ABCP) (q.v.). It is backed by the assets - the securities - that are held by the

issuer of the ABCP. In the run-up to the financial crisis, many structured investment vehicles issued commercial paper to buy MBS made out of nonconforming mortgages. The ABCP issued by these structured investment vehicles was purchased by MMMFs (q.v.). Whoops and whoops.

Swap line

Many FIs outside the U.S. borrow short-term in dollars, not their local currency. If an FI like this gets into a liquidity crisis, it needs LOLR loans of dollars, not the local currency, from its central bank. But where would a foreign central bank get dollars to lend? From the Fed. A "swap line" is the procedure whereby the Fed lends dollars to a foreign central bank so that the foreign central bank can make LOLR loans of dollars to foreign banks. The reverse operation happens rarely, because American FI's rarely borrow in anything but dollars.

Term Asset-Backed Securities Loan Facility(TALF)

A program that the Fed set up during the 2008 crisis to lend on collateral of ABS bonds (q.v.).

Term auction facility (TAF)

This was a program that the Fed set up during the 2008 crisis in an effort to provide LOLR loans in a way that would not be hampered by stigma. That's really all you need to know, but here's more. Quoting from the Fed website, "All loans extended under the TAF were fully collateralized, and the funds were allocated through an auction, in which participating depository institutions placed bids specifying an amount of funds, up to a pre-specified limit, and an interest rate that they would be willing to pay for such funds. The funds were allocated beginning with the highest interest rate offered until either all funds were allocated or all bids were satisfied. All borrowing institutions paid the same interest rate, either the rate associated with the bid that would fully subscribe the auction, or in the case that total bids were less than the amount of funds offered, the lowest rate that was bid."

Term Securities Lending Facility (TSLF)

This was a program that the Fed set up during the 2008 crisis to help primary dealers. It lent Treasury bonds, not money, to primary dealers. The dealer could then use the Treasury bonds as collateral to borrow from anybody through repo (q.v.). The dealer gave the Fed collateral for TSLF loans. The collateral was MBS, ABS (q.v.) or other bonds that lenders to primary dealers would no longer take as collateral for repo loans.

Troubled Asset Relief Program (TARP)

The TARP was a fund set up by the U.S. Treasury, not the Fed. Its original purpose was to help non-bank FIs to which the Fed could not make discount loans (q.v.) without invoking Section 13(3). The original plan for the TARP money was that it would buy up MBS (q.v.) that had become illiquid in the crisis. But it was instead used to recapitalize banks and other FIs. That is, the government used the money to buy shares in the FIs.