Lecture 5:
The Repo Market

Concepts and Buzzwords

- Repurchase Agreements (Repos)
- The Repo Market
- Uses of Repos in Practice

- Repo, reverse repo, repo rates, collateral, margin, haircut, matched book, special repo

Readings

- Tuckman, chapter 15.

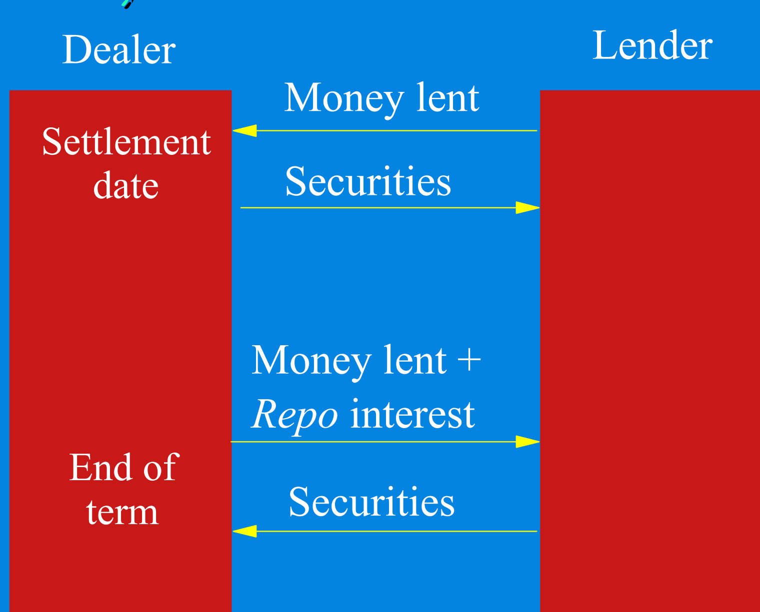
Repos

- We often talk about buying and shorting securities. In practice, these transactions are accomplished with the use of the repo market.
- A repurchase agreement, or *repo,* is a sale of securities for cash with a commitment to repurchase them at a specified price at a future date.
- The repurchase agreement by itself is simply a collateralized loan.

Repo = Collateralized Loan

- Repo = Spot purchase + Forward sale of bond
- Forward sale = Spot sale of bond + Lend money to settlement date
- Therefore,
  - Repo
  - = Spot purchase +Spot sale + Lend money
  - = Lend money

Repo Diagram



The Repo Market

- The daily average of outstanding repos is over $1 trillion in the U.S.
- The repo market provides
  - inexpensive financing for security holders and
  - relatively safe loans for short term investors. (Federal Reserve Regulation Q prohibits banks from paying interest on deposits with maturity less than 30 days.)

Typical Market Participants

- Borrowers or Net Sellers of Collateral
  - Securities Dealers
  - Thrifts
  - Bank portfolios
- Lenders or Net Buyers of Collateral
  - Bank trust departments
  - Money market funds
  - Municipalities
  - Corporations

Types of Collateral

- Treasuries
- Agencies
- Mortgage-backed securities

Term of the Loan

- If the duration of the loan is one day, the agreement is called an *overnight repo*.
  - Approximately 50% of the market.
- Otherwise the agreement is a *term repo*. The term can be as much as one year.
  - The vast majority of repos have maturities of three months or less.
- *Open repo* is an overnight repo that rolls over automatically.

Reverse Repo

- A *reverse repo* transaction is just the other side of a repo transaction. However, the labels are determined from the dealer's viewpoint, so if the dealer borrows, it's a repo and if the dealer lends, it's a reverse repo.

Repo and Reverse Repo Jargon

- *Repo* (Dealer borrows)
  - Sell collateral
  - Borrow money
  - *Reverse out* securities
  - *Repo* securities
- *Reverse Repo* (Dealer lends)
  - Buy collateral
  - Lend money
  - *Reverse in* securities

Credit Risk

- Both parties are subject to credit risk, because the market value of the collateral can change during the life of the loan.
  - For example, suppose a school district enters into a $10mm 30-day *repo* with a low capitalized dealer. The dealer delivers $10mm worth of a T-Note. If the dealer is forced into bankruptcy and cannot repurchase the T-Note, then the school district must sell the collateral in the open market to get its money back. However, if the market has dropped, then the district will suffer a loss.

Ways of reducing the credit exposure

- Margin (Haircut)
  - Lenders often require a margin, or overcollateralization to limit their credit exposure (typically 1% to 3%).
- Mark to Market on a regular basis
  - If the collateral value changes too much, collateral levels or loan balances are adjusted.

Example

- Dealer repos $30 million par of the UST 6.5% of 8/15/05 to a municipality for 51 days.
  - The market value of the collateral is $31,228,715.
  - The municipality lends 98% of the market value, or $30,604,140.70 at a repo rate of 5.25%.
  - After 51 days, the municipality returns the $30 million bonds, and the dealer repays $30,604,140.70 (1+.0525 x 51/360) = $30,831,759.
  - Note that repo rates are *simple interest* rates that use an *actual/360* calendar.

Uses of Repos in Practice

- Financing a long position
  - Most dealers do not own all their inventory outright.
  - They can finance the purchase of a Treasury by simultaneously entering into a repo using the same Treasury as collateral.
  - Note that this amounts to a forward purchase of the Treasury: establishing a long position in bonds with no cash up front.
  - This is an easy way to bet on bond prices rising.

LONG POSITION REPO

Street Dealer Customer

Time 0

buy securities (Street ← Dealer), pay P0 (Dealer → Street)

transfer securities worth P0 (Dealer → Customer), borrow P0(1-hc) (Customer → Dealer)

Net cash flow to dealer = -P0xhc

Time T

sell securities (Dealer → Street), receive PT (Street → Dealer)

get securities back (Customer → Dealer), pay P0(1-hc) + repo interest (Dealer → Customer)

Net cash flow to dealer = PT - (P0(1-hc)+int)

Uses of Repos in Practice, continued...

- Example of Financing a Long Position (Orange County)
  - At the beginning of 1994, the Orange County Investment Pool had about $8 billion.
  - During 1994 the OCIP used the repo market to borrow about $12 billion.
  - The total $20 billion was invested in fixed income securities.
  - During 1994, bond prices fell dramatically.
  - OCIP lost about $1.6 billion.

Uses of Repos in Practice, continued...

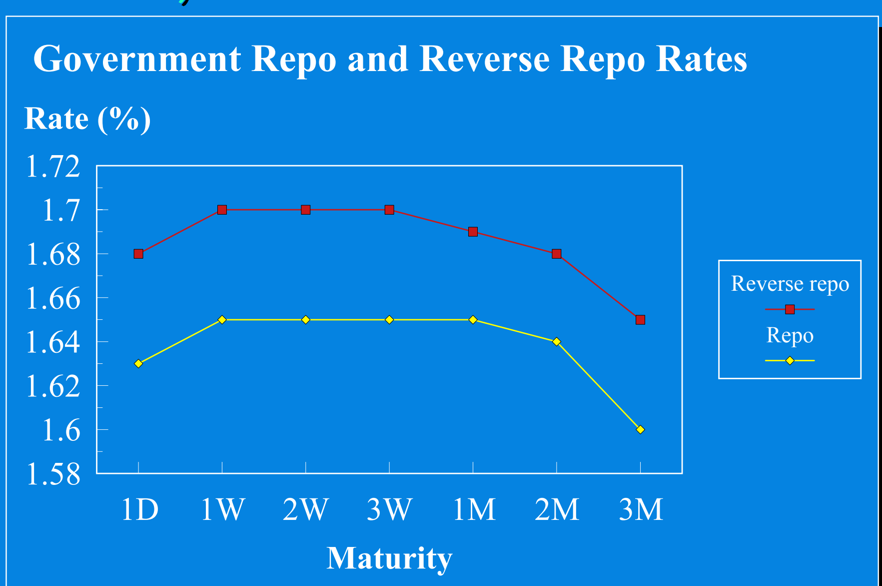
- Establishing a short position
  - Suppose a dealer wants a position that will profit if bond prices decline.
  - He can simultaneously enter into a reverse repo and sell the collateral.
  - He borrows the bond and sells it, using the proceeds of the sale to lend into the reverse repo.
  - At the end of the term of the repo, his loan is repaid with the agreed upon interest, and he buys the bond back in the open market to deliver into the reverse repo.

	REVERSE REPO		SHORT POSITION	
	Customer		Dealer	Street
Time 0		transfer securities worth P0 →		sell securities →
		← lend P0(1-hc)		← receive P0
		Net cash flow to dealer = +P0xhc		
Time T		← return securities		← buy securities back
		receive P0(1-hc)+rp int →		pay PT →
		Net cash flow to dealer = (P0(1-hc)+int) - PT		

Uses of Repos in Practice, continued...

- Running a matched book.
  - The dealer may simply act as an intermediary, entering into a repo with one customer, and an offsetting reverse repo with another.
  - The dealer is compensated by the fact that repo rates (the dealer's borrowing rates) are lower than reverse repo rates (the dealer's lending rates).

Repo Rates 8/12/02



Determinants of the Repo Rate

- The repo rate varies with
  - the quality of the collateral (agencies and mortgages may also serve as collateral in addition to Treasuries),
  - the term of the loan, and
  - the nature of the delivery of the collateral. If the lender requires delivery of the collateral, he may get a lower rate than if he allows the counterparty to merely place the collateral in a separate account at his bank.

Special Repo Rates

- Sometimes certain Treasury bonds go on *special*.
  - Current issues are often on special.
  - A *short squeeze* in which a lot of dealers who have shorted a particular bond need to cover their short positions can cause the issue to become special.
- Reverse repos provide the dealer an opportunity to borrow issues on special.
  - In that case, the issue commands a *special repo rate* below the repo rate for generic collateral.