REPURCHASE AND REVERSE REPURCHASE AGREEMENTS

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Recent years have witnessed a considerable growth in the market for repurchase agreements (RPs), both in terms of daily activity and in the numbers and types of participants in the market. Many years ago RPs, or "repos" as they are frequently called, were used primarily by large commercial banks and government securities dealers as an alternative means of financing their inventories of government securities, but their use has expanded substantially in recent years. RPs are now used regularly by a variety of institutional investors in addition to banks and dealers, and the Federal Reserve Bank of New York (FRBNY) uses repo transactions to implement monetary policy directives and to make investments for foreign official and monetary authorities. This article describes RPs and their principal uses and discusses the factors influencing the growth and development of the RP market over the past few years.

What is a Repo?

A standard repurchase agreement involves the acquisition of immediately available funds through the sale of securities with a simultaneous commitment to repurchase the same securities on a date certain within one year at a specified price, which includes interest or its equivalent at an agreed upon rate.[1] Repo transactions have many characteristics of secured lending arrangements in which the underlying securities serve as collateral. Under this characterization, the sale of securities under an agreement to repurchase is a type of collateralized borrowing and represents a liability to the "seller," reflecting the contractual obligation to transfer funds to the "buyer" on the final maturity date of the agreement.

A reverse RP (technically a matched sale-purchase agreement) is the mirror image of an RP. In a reverse repo, securities are acquired with a simultaneous commitment to resell. Because each party to the transaction has the opposite perspective, the terms repo and reverse repo can be applied to the same transaction. A given transaction is a repo when viewed from the point of view of the supplier of the securities (the party acquiring funds) and a reverse repo when described from the point of view of the supplier of funds.[2] In general, whether an agreement is termed a repo or a reverse repo depends largely on which party initiated the transaction, but an RP transaction between a dealer and a retail customer usually is described from the dealer's point of view. Thus, a retail investor's purchase of securities and commitment to resell to a dealer is termed a repo, because the dealer has sold the securities under an agreement to repurchase.

There is no central physical marketplace in which RPs are negotiated. Rather, transactions are arranged over-the-counter by telephone, either by direct contact or through a group of market specialists (dealers or repo brokers). The securities most frequently involved in repo transactions are U.S. Treasury and federal agency securities, but repos are also arranged using mortgage-backed securities and various money market instruments, including negotiable bank certificates of deposit, prime bankers acceptances and commercial paper. If executed properly, an RP agreement is a low-risk, flexible, short-term investment vehicle adaptable to a wide range of uses. For instance, dealers use repo and reverse repo transactions not only to finance the securities held in their investment and trading accounts, but also to establish short positions, implement arbitrage activities, and acquire securities for their own purposes or to meet specific customer needs.[3] Investors in the repo market, such as nonfinancial corporations, thrift institutions, state and local government authorities, and pension funds, in turn, are provided with a low cost investment alternative which

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[1] Immediately available funds include deposits in Federal Reserve Banks and certain collected liabilities of commercial banks that may be transferred or withdrawn on a same-day basis.

[2] For some participants, notably thrift institutions and the Federal Reserve, the terminology is reversed. That is, the Federal Reserve arranges RPs when it wants to inject reserves (supply funds) temporarily.

[3] A dealer establishes a short position by selling a security he does not have in his inventory. To make delivery of the securities the dealer either borrows them or acquires them by making reverse repurchase agreements.

offers combinations of yields, liquidity, and collateral flexibility not available through outright purchases of the underlying securities.

The key features of RP agreements are described in the following section. Subsequent sections explain the pricing of RP contracts and discuss the various procedures for transferring the different types of collateral between the repo counterparties.

Characteristics of RP Agreements

In most RP agreements, the purchaser of the repo securities acquires title to the securities for the term of the agreement and thus may use them to arrange another RP agreement, may sell them outright, or may deliver them to another party to fulfill a delivery commitment on a forward or futures contract, a short sale, or a maturing reverse RP. This feature makes RPs particularly useful for securities dealers, who use repos and reverses to implement a wide variety of trading and arbitrage strategies. As suggested previously, a wide range of other institutional participants also derive benefits from the RP market. The principal use of repos by these investors is the short-term investment of surplus cash either for their own accounts or on behalf of others in their fiduciary capacities or as agent. The various yields and maturities offered in RP transactions make them well-suited for this purpose.

Maturities RP agreements usually are arranged with short terms to maturity. Most RPs in Treasury securities, for example, are overnight transactions. In addition to overnight contracts, longer-term repos are arranged for standard maturities of one, two, and three weeks, and one, two, three, and six months. Other fixed-term multi-day contracts ("term repos") are negotiated occasionally and repos also may be arranged on an "open" or continuing basis. Continuing contracts in essence are a series of overnight repos in that they are renewed each day with the repo rate adjusted to reflect prevailing market conditions. These agreements usually may be terminated on demand by either party.

Yields In some RP agreements, the agreed upon repurchase price is set above the initial sale price with the difference reflecting the interest expense incurred by the borrower. It is more typical, however, for the repurchase price to be set equal to the initial sale price plus a negotiated rate of interest to be paid on the settlement date by the borrower. Repo interest rates are straight add-on rates calculated using a 360-day "basis" year. The dollar amount of interest earned on funds invested in RPs is determined as follows:

$$\text{Interest earned} = \text{Dollar amount invested} \times \text{Repo rate} \times \frac{\text{Number of days to maturity}}{360}$$

For example, a $25 million overnight RP investment at a 6 3/4 percent rate would yield an interest return of **$4,687.50:**

($25,000,000 × .0675)/360 × 1 = $4,687.50

Suppose instead, that the funds were invested in a 10-day term agreement at the same rate of 6 3/4 percent. In this case, the investor's earnings would be $46,875.00:

($25,000,000 × .0675)/360 × 10 = $46,875.00

As a final example, suppose that the investor chose to enter into a continuing contract with the borrower at an initial rate of 6 3/4 percent, but withdrew from the arrangement after a period of five days. Suppose also that the daily RP rates over the five days were 6 3/4 percent, 7 percent, 6 1/2 percent, 6 3/8 percent, and 6 1/4 percent. Then the total interest earned on the continuing contract would be:

First day:
($25,000,000 x .0675)/360 x 1 = $ 4,687.50
Second day:
($25,000,000 x .07)/360 x 1 = $ 4,861.11
Third day:
($25,000,000 x .065)/360 x 1 = $ 4513.89
Fourth day:
($25,000,000 x .06375)/360 x 1 = $ 4,427.08
Fifth day:
($25,000,000 x .0625)/360 x 1 = $ 4,340.28
Total interest earned: $22,829.86

If the investor had entered into a term agreement for the same period at the rate of 6 3/4 percent prevailing on the first day, he would have earned $23,437.50 in interest. Thus, in this hypothetical example the movement in rates worked to the advantage of the borrower.

The purchaser of securities in a repo transaction earns only the agreed upon rate of return. If a coupon payment is made on the underlying securities during the term of the agreement, the purchaser in most cases must account to the seller for the amount of the payment. Securities in registered definitive form generally are left registered in the seller's name so that any coupon payments made during the repo term may be received directly.

Principal Amounts RP transactions are usually arranged in large dollar amounts. Overnight contracts and term repos with maturities of a week or less are often arranged in amounts of $25 million or more, and blocks of $10 million are common for longer maturity term agreements. Although a few repos are negotiated for amounts under $100,000, the smallest customary amount is $1 million.

Valuation of Collateral Typically, the securities used as collateral in repo transactions are valued at current market price plus accrued interest (on coupon-bearing securities) calculated to the maturity date of the agreement less a margin or "haircut" for term RPs.[4] Technically, the haircut may protect either the lender or the borrower depending upon how the transaction is priced. In the usual case, the initial RP purchase price is set lower than the current market value of the collateral (principal plus accrued interest), which reduces the lender's exposure to market risk. A dealer arranging a reverse RP with a nondealer customer frequently takes margin, which covers his exposure on the funds transferred.

To illustrate the computation of market risk haircuts, consider the case of a lender who in December 1984 was holding $10 million par value of 52-week Treasury bills as collateral for a 7-day term RP agreement. In 1984, the average week-to-week fluctuation in the yield of recently offered 52-week bills was 0.21 percent, measured as the standard deviation of the change in yield from Tuesday to Tuesday. The corresponding price volatility measure was 0.20 percent. To reflect a 95 percent confidence level the lender would compute a market risk haircut factor of 0.50 percent (2.5 times the standard deviation of week-to-week price changes). On December 27, for instance, year bills were trading at a discount rate of 8.38 percent or at a price of $91.504 per $100 par value. Thus, the current market value of the collateral was $9,150,361.11. The lender would calculate its per week risk of loss at $45,751.81 (the market risk haircut factor times the market value), and would value the collateral accordingly at $9,104,609.31 (the current market value less the haircut in dollars).

In principle, the dollar amount of the haircut should be sufficient to guard against the potential loss from an adverse price movement during the repo term. The sizes of haircuts taken in practice usually vary depending on the term of the RP contract, type of securities involved, and the coupon rate of the underlying securities. For example, discount bonds are more price volatile than premium bonds and thus are given larger haircuts. Similarly, haircuts taken on private money market instruments generally exceed those of comparable-maturity Treasury securities, due to an additional credit risk-induced component of price volatility. In general, haircuts are larger the longer the term to maturity of the repo securities, and larger haircuts are common for less liquid securities as well. Currently, market risk haircuts range from about one to five percent, but may be as low as one-eighth of a point for very short-term securities.

Because both parties in a term repo arrangement are exposed to the risk of adverse fluctuations in the market value of the underlying securities due to changes in interest rates, it is common practice to have the collateral value of the underlying securities adjusted daily ("marked to market") to reflect changes in market prices and to maintain the agreed upon margin. Accordingly, if the market value of the repo securities declines appreciably, the borrower may be asked to provide additional collateral to cover the loan. However, if the market value of the collateral rises substantially, the lender may be required to return the excess collateral to the borrower.

Special Repo Arrangements The bulk of the activity in the RP market involves standard overnight transactions in Treasury and agency securities, usually negotiated between a dealer and its regular customers. Although standard overnight and term RP arrangements are most prevalent, dealers sometimes alter various provisions of these contracts in order to accommodate specific needs of their customers. Other arrangements are intended to give the dealer flexibility in the designation of collateral, particularly in longer-term agreements. For example, some contracts are negotiated to permit substitution of the securities subject to the repurchase commitment. In a "dollar repo," for instance, the initial seller's commitment is to repurchase securities that are similar to, but not necessarily the same as, the securities originally sold. There are a number of common variants. In a "fixed-coupon repo," the seller agrees to repurchase securities that have the same coupon rate as those sold in the first half of the repo transaction. A "yield maintenance agreement" is a slightly different variant in which the seller agrees to repurchase securities that provide roughly the same overall return as the securities originally sold. In each case, the maturity of the repurchased securities must be within an agreed upon range, but may be only approximately the same as that of the original securities. These agreements are frequently arranged so that the purchaser of the securities receives the final principal payment from the issuer of the securities.

In other repo arrangements, the repo counterparties negotiate flexible terms to maturity. A common example of this type of contract is the repo to maturity (or reverse to maturity for the lender of funds). In a repo to maturity, the initial seller's repurchase commitment in effect is eliminated altogether, because the purchaser agrees to hold the repo securities until they mature. The seller's repurchase commitment depends on the manner in which the final principal payment on the underlying

[4] The failure of Drysdale Government Securities in May 1982 and Lombard-Wall in August 1982 uncovered weaknesses in the pricing of RPs. RPs are now priced with accrued interest included in full in the purchase price, but prior to adoption of full accrual pricing in October 1982, it was common for RPs to be priced without accrued interest.

securities is handled. When the purchaser of the repo securities receives the final principal payment directly from the issuer of the securities, he usually retains it and nets it against the seller's repurchase obligation. However, if the seller of the repo securities receives the principal payment, he must pay the purchaser the full amount of the agreed upon repurchase price when the repo is unwound.

Reverses to maturity often involve coupon securities trading at a discount from the price at which the "seller" initially purchased them. Typically, reverses to maturity are initiated by an investor who is reluctant to sell the securities outright, because an outright sale would require taking a capital loss on the securities. A reverse to maturity enables the investor to acquire funds to invest in higher yielding securities without having to sell outright and realize a capital loss. The dealer participating in the transaction usually takes margin on the securities "purchased".

Participants in the RP Market

The favorable financing rates and variety of terms and collateral arrangements available have led government securities dealers to expand their use of repos in recent years. Many years ago, dealers relied primarily on collateralized loans from their clearing banks ("box loans") to meet their financing needs, but RPs and reverse RPs are now their principal sources of financing. Major dealers and large money center banks in particular finance the bulk of their holdings of Treasury and agency securities by RP transactions. Most of these transactions are arranged on a short-term basis (i.e., overnight or continuing contracts) via direct contact with major customers, typically banks, public entities, pension funds, money market mutual funds, and other institutional investors. The Federal Reserve Bank of New York also arranges repos and reverse repos with dealers to implement monetary policy directives and to make investments for foreign central banks and other official accounts.

Early each morning a dealer's financing desk arranges repo financing for expected changes in the firm's securities inventory ("long position") and for replacement of maturing RPs, and also arranges reverse RPs to cover known or planned short sales or to meet specific customer needs.[5] The bulk of these arrangements are finalized by 10:00 a.m. Eastern Time.

Dealers use reverse RPs to establish or cover short positions and to obtain specific issues for redelivery to customers. Major suppliers of securities to the market include large commercial banks, thrifts, and other financial institutions. Nonfinancial corporations and municipalities also supply collateral to this market. A dealer "reverses in" securities, in effect, by buying them from the holder under an agreement to resell; the term of the agreement usually ranges from a week to a month, but may also run for the remaining term to maturity of the securities (reverse to maturity). The use of reverse repos to cover short positions is similar to securities borrowing arrangements in which the dealer obtains securities in exchange for funds, other securities, or a letter of credit. However, reversing in securities typically is cheaper than borrowing the securities outright and also gives the dealer greater flexibility in his use of the securities. For instance, reverse RPs are arranged for fixed time commitments, but borrowing arrangements usually may be terminated on a day's notice at the option of the lender.

If a dealer has exhausted its regular customer sources but is still in need of funds or specific collateral, it may contact a repo broker. Dealers use repo brokers most often for term RP agreements and in arranging reverse RPs. The repo brokers market is particularly important for obtaining popular issues in short supply ("on special"). Although the use of bank loans as a source of financing has declined considerably, a dealer still may obtain financing from its clearing bank in the form of an overnight box loan if it has a negative balance in its cash account at the end of the day.[6] The rate the clearing bank charges is generally 1/8 to 1/4 of a point or more above the Federal funds rate, with slightly higher rates charged for loans arranged late in the day, so dealers acquire box loans only as a last resort. A dealer who is unable to obtain adequate financing using his own customer base, or has an unexpected receipt of securities late in the day, may choose to obtain a "position" loan from another bank rather than a box loan from his own clearing bank. Position loans are often available at more favorable rates than available on box loans. In these circumstances, the lender frequently wires the dealer's clearing bank the amount of the loan. The clearing bank, in turn, segregates the required amount of the dealer's securities as collateral for the loan and acts as custodian for the lender.

In addition to using repos and reverse repos to finance their long and short positions, dealers also use RP agreements in transactions in which they act as inter-

[5] A short sale is the sale of securities not currently owned, usually under the expectation that the market price of the securities will fall before the termination date of the transaction. The seller later purchases the securities at a lower price to cover his short position and earns an arbitrage profit.

[6] Securities received by a clearing bank on behalf of a dealer customer generally are delivered first into a central clearing account known as the "box." Any securities that have not been allocated to other uses by the dealer, and have not been financed through other means, may be used to collateralize an overnight loan (box loan) from the clearing bank.

mediaries between suppliers and demanders of funds in the repo market. A dealer acts as principal on each side of the arrangement, borrowing funds from one party (against the sale of securities) and relending the funds to another party (against the receipt of securities). The combination of repo and reverse repo transactions in this fashion is termed a "repo book." A repo book in which an RP and a reverse RP in the same security have equal terms to maturity is referred to as a "matched book." Larger, better capitalized dealers are able to borrow in the RP market at more favorable rates than smaller dealers and non-dealer customers, and thus can profit through arbitrage in matched transactions. Dealers also may profit from a differential in the margin taken on the underlying collateral in the two transactions.

At times, a dealer may choose not to match the maturities of the repo and reverse repo agreements in an effort to increase profits. For example, if interest rates are expected to rise during the term of the agreement, the dealer may arrange an RP with a longer term than the reverse RP in order to "lock in" the more favorable borrowing rates. Conversely, in a declining rate environment, a longer-term reverse RP may be financed through a number of shorter-term RPs arranged at successively lower rates.

Many types of institutional investors derive benefits from RP and reverse RP transactions with dealers, including nonfinancial corporations, state and local government authorities and other public bodies, banks, and thrift institutions. Repos are adaptable to many uses and RP maturities can be tailored precisely to meet the needs of lenders. This enables corporations and municipalities with temporary surplus cash balances to earn market rates of return on a timely basis but have their funds available when needed. Thus, in effect, RP agreements convert cash balances into interest-bearing liquid assets. In this fashion, RPs are more attractive investments than alternative money market instruments which do not offer the same combination of liquidity, flexibility, and ease of negotiation. Newly issued negotiable CDs, for example, must have a minimum maturity of at least 14 days and commercial paper is seldom written with maturities as short as a day.

Repos are also attractive investments for investors subject to restrictions on the types of assets in which they may invest. Many public bodies, for example, are required by law to invest their tax receipts and proceeds from note and bond sales in Treasury or federal agency issues until the funds are to be spent. As opposed to buying the securities outright, these entities often invest in repos collateralized by government securities and record the ownership of the securities rather than the repos on their books.

The Federal Reserve also is a major participant in the repo market. When the Manager of the System Open Market Account needs to inject reserves in the banking system overnight or for a few days, the Domestic Trading Desk of the FRBNY arranges RPs with primary dealers in government securities.[7] These agreements are arranged for specified periods of up to 15 days and are collateralized by Treasury and agency securities. Investments on behalf of foreign official and international accounts also involve RPs, either arranged in the market or internally with the System's Account. When the Manager wants to absorb reserves for a few days, the Desk arranges matched sale-purchase transactions with primary dealers, in which specific securities are sold from the System's portfolio for immediate delivery and simultaneously repurchased for settlement on the desired date.

Growth and Development of the RP Market

It is difficult to ascertain when the repurchase agreement originated. Some suggest that RPs date back to the 1920s, about the time that the Federal funds market evolved. Other sources state that the use of RPs was initiated by government securities dealers after World War II as a means of financing their positions. There is general agreement, however, that for many years RPs were used almost exclusively by government securities dealers and large money center banks. Since the late 1960s however, the number and types of participants in the RP market has grown considerably.

A number of factors have influenced the growth and development of the RP market over this period, including changes in the regulatory environment, inflation, growth in federal debt outstanding, and increased interest rate volatility. The higher levels and greater volatility of interest rates since the 1960s have been particularly important. They have raised the opportunity cost of holding idle cash balances in demand deposit accounts, on which the explicit payment of interest is prohibited, and have led to an expanded use of active cash management techniques. Accompanying these developments have been key innovations in telecommunications and

[7] Primary dealers are a group of dealers who have met eligibility criteria established by the Federal Reserve Bank of New York (FRBNY). To be on the FRBNY's primary dealer list, a firm is expected to make markets in the full range of Treasury and agency issues under "good' and "bad" market conditions for a diverse group of nondealer customers, and to maintain certain minimum capital levels. The FRBNY selects appropriate counterparties from this list when it conducts open market operations.

computer technology, which have contributed to the development of sophisticated cash management systems for managing and transferring large volumes of funds. As a consequence, a variety of financial institutions, nonfinancial corporations, pension funds, mutual funds, public bodies, and other institutional investors have joined securities dealers and money center banks as active participants in the RP market.

As a result of this growth, the RP market is now considered to be one of the largest and most liquid markets in the world. Although total daily activity in the RP market is not known, as most agreements are negotiated directly between counterparties over the telephone, an indication of the growth in the market over recent years can be seen in the use of RPs and reverse RPs by primary dealers. As shown in Table I, on an annual average basis, repo financing by major dealers has nearly tripled since 1981. The same is true for the use of matched book transactions (Table II), which account for about half of all repo transactions. In fact, for some nonbank dealers matched book transactions account for as much as 90 percent of overall repo activity. Bank dealers are subject to capital requirements imposed by bank regulators, which raise the cost of using these transactions relative to alternative investments; thus, they have not participated as much in the use of matched RP agreements.

The rapid growth and development of the RP market over recent years has not occurred without incident. In particular, the failures of a few unregistered non-primary government securities dealers has had a significant effect on the operation of the market. These failures generally had some common characteristics, including the use of pricing techniques which ignored accrued interest in computing the value of repoed securities, and the. fraudulent use of customers' collateral. The failures resulted in considerable uncertainty regarding the legal status of repos and the contractual rights of the counterparties when one of them files for protection under federal bankruptcy laws.

Repurchase agreements have never been defined in a strict legal sense either as collateralized loans or as outright purchases and sales of securities. Under recent court rulings involving the bankruptcy proceedings of Bevill, Bresler, and Schulman, Inc., the court has determined that the appropriate characterization of a repo for legal purposes depends upon the manner in which the transaction was arranged. For instance, if the repo counterparties arranged the transaction as a consummated sale and contract to repurchase, then the court would adopt the same characterization in the event of a default and subsequent bankruptcy of one party.

Market participants have long operated under the assumption that the purchaser of repo securities is entitled to liquidate them if the seller is unable to fulfill the terms of the agreement at settlement, but the validity of this assumption relies importantly on the court's interpretation. For instance, in September 1982, in the bankruptcy proceedings involving Lombard-Wall, Inc., Federal Bankruptcy Judge Edward J. Ryan ruled that certain repos involved in that case were to be considered secured loan transactions for purposes of the proceedings.[8] As a consequence, under the existing law, RPs became

Table I

ANNUAL AVERAGES OF OUTSTANDING REPURCHASE AND REVERSE REPURCHASE AGREEMENTS BY CATEGORY OF PRIMARY DEALER[1]

(Millions of Dollars)

Year	Bank Dealers	Nonbank Dealers	Total
1981	19,173	92,565	111,738
1982	22,337	147,890	170,227
1983	24,812	159,319	184,131
1984	26,706	218,282	244,988
1985	34,453	286,365	320,818

[1] Figures are obtained from reports submitted weekly to the Federal Reserve Bank of New York by the U.S. government securities dealers on its published list of primary dealers. Figures include matched agreements.

Table II

ANNUAL AVERAGES OF OUTSTANDING MATCHED REPURCHASE AND REVERSE REPURCHASE AGREEMENTS OF PRIMARY DEALERS[1]

(Millions of Dollars)

Year	Bank Dealers	Nonbank Dealers	Total
1981	6,167	51,177	57,344
1982	7,534	88,315	95,849
1983	6,839	84,523	91,362
1984	7,207	121,938	129,145
1985	9,118	152,914	162,032

[1] Figures are obtained from reports submitted weekly to the Federal Reserve Bank of New York by the U.S. government securities dealers on its published list of primary dealers. Figures include repurchase agreements, duebills, and collateralized loans used to finance reverse repurchase agreements, as well as the reverse side of these transactions.

[8] Lombard-Wall failed in August 1982 when it was unable to return funds it had obtained in overvalued long-term RPs. The failure of Lombard-Wall occurred shortly after the collapse of Drysdale Government Securities, Inc. Drysdale failed in May 1982 when it was unable to make payments on accrued interest on securities it had acquired under RP agreements and could not return the securities it had obtained through over-collateralized reverse RPs.

subject to the "automatic stay" provisions of the Bankruptcy Code. The automatic stay provisions block any efforts of a creditor to make collections or to enforce a lien against the property of a bankrupt estate. Consequently, Lombard-Wall's repo counterparties could neither use the funds obtained nor sell the underlying repo securities without the court's permission, because to do so would constitute the enforcement of a lien and thus would violate the automatic stay provision.

As a result of the developments in the Lombard-Wall case, the perceived risks of lending in the RP market were raised, resulting in a contraction in the volume of repo transactions entered into by non-dealer entities, including mutual funds and state and local government authorities. With the reduction in a major source of repo funds, the financing costs for some non-primary dealers rose, as other participants regarded them as higher credit risks. At the same time RP rates paid by some well-capitalized firms declined somewhat. Similar movements in repo financing rates have occurred in the wake of failures of other government securities dealers, including the recent failures of E.S.M. Government Securities, Inc. and Bevill, Bresler, and Schulman Asset Management Corp. in 1985.

In response to the repurchase agreement issue, Congress, in June 1984, enacted the Bankruptcy Amendments Act of 1984, which amended Title 11 of the U. S. Code covering bankruptcy. The legislation exempts repurchase agreements in Treasury and agency securities, certain CDs, and bankers acceptances from the automatic stay provision of the Bankruptcy Code. Although the legislation does not resolve the question of whether an RP agreement is a secured lending arrangement or a purchase and sale transaction, it enables lenders to liquidate the underlying securities under either interpretation and resolves a major question about the status of RP collateral in bankruptcy proceedings.[9]

With the encouragement of the Federal Reserve Bank of New York (FRBNY), primary dealers began to include the value of accrued interest in the pricing of RPs and related transactions in October 1982. At that time, the FRBNY also recommended that dealers follow uniform procedures in establishing repo contract value for purposes of maintaining margin. These actions helped to correct certain inadequacies in standard repo pricing practices.

However, recent dealer failures have demonstrated that proper pricing of repo transactions alone is insufficient to ensure the safety of a repo investment. Investors must also concern themselves with the creditworthiness of their repo counterparties. For instance, many of the investors dealing with E.S.M. and Bevill, Bresler, and Schulman lost their money because they did not protect their ownership interest in the repo securities pledged to them as collateral. Investors can best establish their ownership claim to repo securities by taking delivery of the securities, either directly or through a clearing bank-custodian.

[9] Note that the automatic stay provision is irrelevant if an RP is considered to be an outright purchase and sale of securities.

Repo Collateral Arrangements

As mentioned previously, most RPs involve Treasury and federal agency securities, the bulk of which are maintained in book-entry form. Usually, when an RP is arranged, the underlying securities are transferred against payment over the Federal Reserve's securities wire ("Fedwire") to the lender/purchaser, resulting in a simultaneous transfer of funds to the borrower. At maturity, the RP collateral is returned over the wire against payment and the transfers are reversed. Direct access to the Federal Reserve's securities and payments transfer systems is restricted, so transfers of the repo securities usually are processed by means of Reserve Bank credits and debits to the securities and clearing accounts of depository institutions acting as clearing agents for their customers. Transfers of physical securities also frequently involve clearing agents.

The transaction costs associated with the payment and delivery of repo securities include some combination of securities clearance fees, wire transfer charges for securities in book-entry form, custodial fees, and account maintenance fees. The exact charges can vary considerably from case to case depending on the type of securities involved and the actual method of delivery. For example, Fedwire charges for securities transfers are higher for off-line originations than for transfers initiated on-line, and the fees for transfers of agency securities are slightly higher than those for Treasury securities. In any event, the total transaction costs to process transfers of securities from the seller/borrower to the buyer/lender are higher the greater the number of intermediate transactions. Although these costs are often inconsequential for longer-maturity transactions in large dollar amounts, they may add significantly to the overall costs of others. As a result, a number of repo collateral arrangements have been developed that do not involve the actual delivery of collateral to the lender. Not surprisingly, the rates available to investors in such nondelivery repos are higher than rates offered on standard two-party RPs with collateral delivery. Of course, the risks may be greater as well.

At one end of the spectrum of nondelivery repos is the "duebill" or letter repo. A duebill in essence is an unsecured loan similar in form to commercial paper; the borrower merely sends a transaction confirmation to the lender. Although specific securities might be named as collateral, the lender does not have control of the

securities. Thus, the lender relies for the most part on the integrity and creditworthiness of the borrower. Duebills are used primarily in overnight arrangements that involve small par amounts of non-wireable securities.

A similar arrangement is the "hold-in-custody" repo in which the borrower retains possession of the repo securities but either transfers them internally to a customer account or delivers them to a bulk segregation account at its clearing bank; the securities are left in the dealer's name and not that of the individual customers. The extent to which the investor's ownership interest in the pledged securities is protected depends on the type of custody arrangement. If the borrower acts as both custodian and principal in the transaction, the investor relies on the borrower's integrity and creditworthiness.[10]

A lender can protect his ownership claim to repo securities by using "safekeeping" arrangements involving a clearing bank-custodian acting solely in its behalf or jointly as agent for both repo counterparties. The most popular of these arrangements is the "triparty repo" in which a custodian, typically the borrower's clearing bank, becomes a direct participant in the repo transaction with the borrower and lender. The clearer-custodian ensures that exchanges of collateral and funds occur simultaneously and that appropriate operational controls are in place to safeguard the investor's ownership interest in the underlying collateral during the term of the agreement. When the repo is unwound at maturity, the clearer makes an entry in its internal records transferring the securities from the segregation account to the borrower's clearing account and wires the loan repayment to the lender.

The rates available to investors in tri-party repos are lower than those available on nonsegregated RPs without collateral delivery, but higher than the rates offered on standard two-party RPs with delivery. Thus, safekeeping arrangements of this type are attractive both to investors, who earn a higher risk-adjusted return than available on standard RPs, and to borrowers, whose total financing costs are lowered through the avoidance of clearance costs and wire transfer fees.

Determinants of RP Rates

The interest rate paid on RP funds, the repo rate of return, is negotiated by the repo counterparties and is set independently of the coupon rate or rates on the underlying securities. In addition to factors related to the terms and conditions of individual repo arrangements, repo interest rates are influenced by overall money market conditions, the competitive rates paid for comparable funds, and the availability of eligible collateral. As mentioned previously, changes in the perceived risks associated with RP investments also affect the level of RP rates and the spreads between RP rates and comparable money market rates.

Because repurchase agreements are close substitutes for Federal funds borrowings, overnight RP rates to a large extent are determined by conditions in the market for reserve balances and thus are closely tied to the Federal funds rate. For example, when the demand for reserves is high relative to the existing supply, depository institutions bid more aggressively for Federal funds, thereby putting upward pressure on the Federal funds rate. As the funds rate rises, some institutions will enter into repurchase agreements, which also puts upward pressure on the RP rate. Both rates will continue to rise until the demand and supply for reserves in the banking system is again in balance.[11] Federal Reserve policy actions have a major influence on overnight financing rates through their effect on the supply of reserves via open market operations and discount window policy.

Repo rates for overnight RPs in Treasury securities, usually lie about 25 to 30 basis points below the Federal funds rate. Properly executed RP agreements are less risky than sales of Federal funds because they are fully backed by high-quality collateral. Thus, the rate spread generally reflects a risk premium paid to compensate investors for lending unsecured in the Federal funds market rather than investing in a collateralized RP agreement. The spread between the Federal funds rate and RP rate has narrowed when the perceived risks associated with RP investments have increased, e.g., when the legal status of the repo securities backing an RP agreement has come under question.

The spread between the funds rate and the RP rate can also depend on the supply of collateral held by government securities dealers. Dealers reduce their demand for RP financing when the dollar volume of securities they hold in their investment and trading accounts is low.[12] Other things the same, this also puts downward pressure on the RP rate relative to the Federal funds rate. Conversely, the RF rate rises, and the rate spread narrows, when the volume of securities to be financed is high relative to the availability of overnight financing. This

[10] Under the Uniform Commercial Code, an investor can establish an ownership interest in securities it has left with a dealer for a period of up to 21 days if it obtains a proper written agreement and "gives value" for the securities.

[11] See Kenneth D. Garbade [1982, Chapter 5].

[12] This sometimes occurs after major tax payments when incoming tax receipts exceed the capacity of Treasury Tax and Loan (TT&L) accounts at commercial banks and are transferred to the Treasury's account at Federal Reserve Banks. Because the transfer of funds from the public to the Federal Reserve (Fed) drains reserves from the banking system, the Fed often arranges RPs to inject reserves to offset the effect of the movement. These RPs must be collateralized, of course, and funds held in TT&L accounts also must be collateralized. Both actions tend to remove a large quantity of eligible collateral from the market.

sometimes occurs after Treasury mid-quarter refundings, particularly when the new issues are not well distributed to investors.

Conclusion

The use of RPs as a major financing vehicle is likely to continue to expand during the forseeable future, with a sizable increase in the volume of RPs outstanding and a broadening of the types of assets used as collateral. In coming years, the move toward a more complete globalization of securities markets and the associated growth in trading activity will further enhance the demand for flexible financing arrangements. This is likely to be associated with further efforts to clarify the rights of repo counterparties in written agreements and the expanded use of triparty agreements and other segregation arrangements.

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