

Appendix — Pricing and Valuation of Securities: Introduction to Common Types of Securities

This handout provides summary information for common security types held by entities in their investment portfolios and employee benefit plans.

1. Treasury Security

What Is a Treasury Security?

- U.S. Treasury securities are bills, notes, and bonds (collectively known as “Treasury securities”) issued by the Treasury Department that represent direct obligations of the U.S. government. Marketable Treasury securities are backed by the full faith and credit of the U.S. government.
- Treasury bills (“T-bills”) mature in one year or less, do not pay interest before maturity, and are sold at a discount. Many regard T-bills as the least risky investments available to investors.
- Treasury notes mature in two to 10 years and pay interest semiannually. The 10-year Treasury note has become the security most frequently quoted when discussing the performance of the U.S. government bond market.
- Treasury bonds cover terms of more than 10 years and are currently issued only in maturities of 30 years. Interest is paid semiannually.
- Treasury inflation-protected securities (TIPS) are inflation-indexed bonds whose principal is adjusted to the consumer price index (CPI) and multiplied by the constant coupon rate protecting the holder against inflation.

Pricing and Markets

- In the primary market, Treasury securities are issued by the government through yield auctions of new issues for cash. A group of primary dealers must buy large quantities of Treasury securities every time there is an auction and stand ready to trade them in the secondary market.
- Secondary trading in Treasury securities occurs in the over-the-counter (OTC) market. In the secondary market, the most recently auctioned Treasury issue is considered current or on the run. Issues auctioned before current issues are typically referred to as off-the-run securities. In general, current issues are much more actively traded and have much more liquidity than off-the-run securities. This often results in off-the-run securities trading at a higher yield than similar maturity-current issues.
- A wide range of investors use Treasury securities for investing, hedging, and speculation. These investors include banks, insurance companies, pension funds, mutual funds, state and local governments, foreign interests, and retail investors.

- Price transparency is relatively high for Treasuries. Prices are available from various newspapers and Web sites. Yield information, including historical yields, is available for various fixed maturities from the U.S. Department of the Treasury Web site (www.treas.gov).

Types of Risk

- *Interest rate risk* — Treasuries are subject to price fluctuations because of changes in interest rates. Longer-term issues have more price volatility than do shorter-term instruments.
- *Liquidity risk* — Because of their lower liquidity, off-the-run securities generally have a higher yield than current securities.

2. Certificate of Deposit

What Is a CD?

- A certificate of deposit (CD) is a time deposit, meaning the investor agrees to place funds on deposit with the bank for a stated period. CDs are available from banks, securities brokers, and other financial institutions. CDs typically offer a higher rate of interest than a regular savings account since they do not provide immediate access to the funds.
- All CDs do not have the same features. Banks are free to offer CDs with different maturities (i.e., three months, one year, five years) and different methods of determining interest and payment features (e.g., callable). Withdrawals before the date of maturity are usually subject to a substantial penalty, so it is generally not in a CD holder's best interest to withdraw the money before maturity.

Pricing and Markets

- Although not obligated to do so, some securities brokers may be willing to purchase, or arrange for the purchase of, an investor's CD before maturity. The broker may refer to this activity as a secondary market. This is not early withdrawal. The price the CD holder receives for the CD will reflect several factors, including the then-prevailing interest rates, the time remaining until the CD matures, and the features of the CD. Depending on market conditions, the CD holder may receive more or less than the original price of the CD.

Types of Risk

- CDs are similar to savings accounts in that they feature Federal Deposit Insurance Corporation (FDIC) insurance coverage up to \$250,000 and have limited risk.

3. Municipal Security

What Is a Muni?

- A municipal security (muni) is an obligation issued by a state, county, city, or other local government or its agencies. The two principal classifications of munis are general obligation bonds and revenue bonds.
- General obligation bonds are typically considered the most secure type of municipal bond because they are secured by the full faith and credit of an issuer with taxing power. In the event of default, the holders of general obligation bonds have the right to compel a tax levy or legislative appropriation to satisfy the issuer's obligation on the defaulted bonds.
- Revenue bonds are payable from a specific source of revenue, so that the full faith and credit of an issuer with taxing power is not pledged. Revenue bonds are payable only from specifically identified sources of revenue. Pledged revenues may be derived from operation of a financed project, grants, and excise or other taxes. Industrial development bonds are a common example of revenue bonds.
- Interest income from municipal bonds is often tax exempt; therefore, investors usually accept lower interest payments than on other types of borrowing (assuming comparable risk).

Pricing and Markets

- State and local government entities can market their new bond issues by offering them publicly or placing them privately with a small group of investors. Munis historically have not been listed on or traded in exchanges. However, there are strong and active secondary markets for munis that are supported by municipal bond dealers.
- Prices for public issues are more readily available than are prices for private placements.
- Larger issuers of munis are rated by nationally recognized rating agencies. Other issuers may achieve an investment-grade rating through the use of credit enhancements, such as insurance from a municipal bond insurance company or a letter of credit issued by a financial institution.

Types of Risk

- *Credit risk* — Muni activities involve different degrees of credit risk that depend on the financial capacity of the issuer or economic obligor. For revenue bonds, the ability to perform depends primarily on the success of the project or venture funded by the bond. The large number of different issuers (as many as 60,000 entities issue municipal bonds) also makes credit analysis of munis more difficult. This heightens the importance of the role of the rating agencies and bond insurers in comparison to other markets.
- *Market risk* — Holders of munis are affected by changes in marginal tax rates. For example, a reduction in marginal tax rates would lower the tax-equivalent yield on the security, causing the security to depreciate.

- *Liquidity risk* — One of the problems in the municipal market is the lack of ready marketability for many municipal issues. Many municipal bonds are relatively small issues, and most general obligation issues are sold on a serial basis, which in effect divides the issues into smaller components. Furthermore, a large percentage of munis are purchased by retail investors and small institutions that tend to hold securities to maturity.
- *Interest-rate risk* — Like other fixed-income securities, fixed-income munis are subject to price fluctuations based on changes in interest rates. The degree of fluctuation depends on the maturity and coupon of the security. Variable-rate issues are typically tied to a money market rate, so their interest-rate risk will be significantly less.
- *Call risk* — Prepayment or call provisions that allow the issuer to pay the investor before the bond's maturity date will also affect the price of a muni.

4. Agency Security

What Is an Agency Security?

- “Agencies” is a term used to describe debt obligations issued by either government agencies or government-sponsored agencies (GSEs). GSEs were created by the U.S. Congress to foster a public purpose, such as affordable housing.
- An example of a government agency is the Government National Mortgage Association (Ginnie Mae). Securities issued by government agencies are backed by the full faith and credit of the U.S. government (i.e., an explicit guarantee).
- Examples of GSEs include the Federal National Mortgage Association (FNMA or Fannie Mae) and the Federal Home Loan Mortgage Corporation (FHLMC or Freddie Mac).

Common Agency Securities

- *Fannie Mae* — Publicly traded company created to provide liquidity to the mortgage market. Fannie Mae borrows in the capital markets (i.e., it issues agency debt) and uses the proceeds to finance the purchase of residential mortgages from lenders who originated them. Fannie Mae then issues mortgage-backed securities (MBSs) on the basis of the pools of mortgages it purchases (see the “Mortgage-Backed Securities” section below).
- *Freddie Mac* — Publicly traded company created to increase the availability of mortgage credit to finance housing. Freddie Mac's goal is to stabilize the secondary market for home mortgages by helping to distribute investment capital available for financing home mortgages. It buys mortgage pools from lenders and securitizes them into guaranteed participation certificates (PCs) as well as other MBSs, which are sold to investors in the secondary market (see the “Mortgage-Backed Securities” section below). Freddie Mac issues debt to finance its mortgage and PC purchases.

Pricing and Markets

- GSEs issue both discount and coupon notes and bonds. Discount notes are short-term obligations, with maturities ranging from overnight to 360 days. Coupon notes and bonds are sold with maturities greater than two years.
- In the primary market, government agencies and GSEs sell their securities to a select group of commercial banks, section 20 subsidiaries of commercial banks, and investment banks known as “selling groups.” Members of a selling group advise the agencies on issuing debt, placing the debt with end users, and making markets in these securities.
- Prices for the securities traded in the secondary market can be obtained from the *Wall Street Journal* or the financial section of local newspapers. Other media, such as Internet financial sites, provide OTC quotes as well.
- Securities of GSEs trade at yields generally offering a narrow spread over Treasury security yields because of slightly greater credit risk (because of the lack of an explicit government guarantee for most obligations) and somewhat lower liquidity.

Types of Risk

- *Interest-rate risk* — Agency securities are subject to price fluctuations resulting from changes in interest rates. As with other types of securities, the longer the term of the security, the greater the fluctuation and level of interest-rate risk. For example, if interest rates rise, the value of an agency bond on the secondary market will most likely fall.
- *Credit risk* — Although the credit risk of agency securities is slightly higher than that of Treasuries because they are not explicitly guaranteed by the U.S. government, their credit risk is still low because of the implied government guarantee.
- *Liquidity risk* — Agency securities as a whole are not as liquid as Treasury securities, but liquidity varies widely within the agency market depending on the issuer and the specific debt obligation. In general, agency securities have large trading volumes on the secondary market that help to keep the liquidity risk low.
- *Call risk* — Many agency securities carry call provisions that allow the issuer to pay the investor before the bond’s maturity date, typically when interest rates drop, leaving the investor to reinvest at lower prevailing rates.

5. Commercial Paper

What Is Commercial Paper?

- Commercial paper is a money market security issued by large corporations. It is generally not used to finance long-term investments; rather, it is used to purchase inventory or to manage working capital. As a relatively low-risk investment, commercial paper returns are not large. Because commercial paper maturities do not exceed 270

days and proceeds typically are used only for current transactions, they are exempt from registration with the SEC.

- Commercial paper is an alternative to lines of credit with a bank. Once a business becomes large enough and maintains a high enough credit rating, it will be able to use commercial paper, which is more economical than using a bank line of credit.
- Commercial paper backed by assets — such as mortgages (including prime and subprime), credit cards, or other receivables — is referred to as asset-backed commercial paper (ABCP). A company looking to enhance liquidity may sell assets to a bank or other conduit, which, in turn, will issue them to its investors as commercial paper. The commercial paper is backed by the expected cash inflows from the assets. The main risks faced by ABCP investors are (1) asset deterioration in the conduit's underlying portfolio, (2) potential timing mismatches between the cash flows of the underlying assets and the repayment obligations of maturing paper, and (3) a conduit's inability to issue new commercial paper.

Pricing and Markets

- Commercial paper is zero-coupon debt, meaning that the investor buys the instrument at a discount from face value (par), holds the instrument until maturity, and earns interest income based on the difference between the buy price and the face value.
- In general, each issuer's commercial paper is rated by Standard & Poor's (S&P) and Moody's. Those ratings are similar to ratings for longer-maturity corporate bonds but are specifically created for commercial paper. Commercial paper ratings place more emphasis on liquidity.

Types of Risk

- *Interest-rate risk* — Like the prices of all fixed-income securities, prices of commercial paper are susceptible to fluctuations in interest rates. If interest rates rise, commercial paper prices will decline. However, the short-term nature of a commercial paper investment makes it less susceptible to interest-rate risk.
- *Credit risk* — With most fixed-income securities, there is a chance that the issuer will default on its commercial paper obligation.
- *Liquidity risk* — Issuers of commercial paper could have difficulty rolling over their commercial paper if there are no investors to buy the new issuance. Issuers can reduce this risk by securing backup lines of credit from banks. Also, specific to ABCP, if there are significant negative developments in any of the markets underlying the ABCP, this could affect the perceived quality and risk of ABCP. Because commercial paper investors may be risk averse, concerns about ABCP may cause them to seek other short-term, cash-equivalent investments.

6. Corporate Bond

What Is a Corporate Bond?

- Corporate bonds may be either secured or unsecured. If a bond is secured, the issuer has pledged specific assets (known as collateral) that can be sold, if necessary, to pay the bondholders. If the debt is unsecured, the bonds are known as debentures (backed by the issuer's general credit).
- Corporate bonds tend to be categorized as either investment grade or noninvestment grade. Investment grade bonds are rated BBB or higher by S&P and Baa or higher by Moody's. Noninvestment-grade bonds, also referred to as "high yield" or "junk" bonds, tend to pay higher yields than investment-grade corporate bonds. However, this higher yield reflects the higher level of credit risk.
- Interest may be fixed or floating, or the bonds may be zero-coupon bonds. Interest on corporate bonds is typically paid semiannually and is fully taxable to the bondholder. Most corporate bonds are issued with maturities ranging from one to 30 years.

Pricing and Markets

- Bond ratings are published by several organizations that analyze bonds and express their conclusions by means of a rating system. Major nationally recognized statistical rating organizations in the United States include Moody's and S&P.
- The major factors influencing the value of a corporate bond are (1) its coupon rate relative to prevailing market interest rates; (2) the issuer's credit standing; and (3) other features, such as the existence of call options, put features, sinking funds, convertibility features, and guarantees or insurance.
- Most corporate bonds are traded on the OTC market and are priced as a spread over U.S. Treasuries. Most often, the benchmark U.S. Treasury is the on-the-run (current coupon) issue. Corporate bonds usually yield more than government or agency bonds because of the presence of credit risk.

Types of Risks

- *Interest Rate Risk* — Prices of fixed-income bonds fluctuate with changes in interest rates. The degree of interest-rate sensitivity depends on the maturity and coupon of the bond. Floating-rate issues lessen the bank's interest-rate risk to the extent that the rate adjustments are responsive to market rate movements.
- *Prepayment risk* — A call provision giving the issuer the right to redeem the bond before maturity has the potential to adversely alter the investor's exposure. The issue is most likely to be called when market rates have moved in the issuer's favor, leaving the investor with funds to invest in a lower-interest-rate environment.

- *Credit risk* — Credit risk is a function of (1) the financial condition of the issuer or (2) the degree of support provided by a credit enhancement. The bond rating may be a quick indicator of credit quality. Some bonds will include a credit enhancement in the form of insurance or a guarantee by another corporation, thereby reducing the rate of interest that the issuer must pay.
- *Liquidity risk* — Major issues are actively traded in large amounts and liquidity concerns may be small. Trading for many issues, however, may be inactive and significant liquidity problems may affect pricing. The trading volume of a security determines the size of the bid/ask spread of a bond. This provides an indication of the bond's marketability and, hence, its liquidity.
- *Event risk* — This is the risk of an unpredictable event that immediately affects the ability of an issuer to service the obligations of a bond. Examples of event risk include leveraged buyouts, corporate restructurings, or court rulings that affect the credit rating of a company.

7. Asset-Backed Security

What Is an ABS?

- An asset-backed security (ABS) is a type of bond or note collateralized by the cash flows from a specified pool of underlying assets that otherwise could not easily be traded. Securitization makes these assets available for investment to a broader set of investors. These asset pools can be made of any type of asset with a revenue stream, such as credit card receivables, auto loans, or student loans.
- Most trading of ABSs is done in OTC markets. Compared to Treasuries and MBSs (see the “Mortgage-Backed Securities” section below), many ABSs are not liquid and their prices are not transparent, partly because ABSs are not as standardized as Treasuries or even MBSs.
- An ABS differs from most other kinds of bonds in that an ABS assumes the credit risk of the underlying assets without taking on specific corporate credit risk of the originator.

Pricing and Markets

- As with any fixed-income securities, the yield on an ABS depends on the purchase price in relation to the interest rate (which may be fixed or floating) and the length of time the principal is outstanding. But with an ABS (as with an MBS), prepayment assumptions must be taken into account in determining the most likely yield of a given issue.
- New issues of ABSs carry higher estimated yields than do U.S. Treasury securities and many corporate bonds of comparable maturity and credit quality. A key reason is that investors demand a higher interest rate to compensate for prepayment risk and the resulting uncertainty in the average life of an ABS.
- Once securities are trading in the secondary market, the spreads between ABSs and Treasuries or comparable corporate bonds may widen or narrow depending on market

conditions, including (1) the direction of interest rates in the economy, (2) the number of issues coming to market, and (3) factors specific to each type of ABS. For example, a rising level of personal bankruptcies may cause the perception of risk in credit card ABSs to increase, requiring higher yields to entice investors.

- The rating agencies determine the amount of credit enhancement required to produce a credit quality comparable to that of an identically rated corporate bond.
- A popular type of internal credit enhancement is the senior/subordinated (A/B) structure. It is characterized by a senior (A) class of securities and one or more subordinated (B, C, etc.) classes that function as the protective layers for the A tranche. If a loan in the pool defaults, any loss thus incurred is absorbed by the subordinated securities. The A tranche is unaffected unless losses exceed the amount of the subordinated tranches. The senior securities are the portion of the ABS issue that is typically rated AAA at issuance, while the lower-quality (but presumably higher yielding) subordinated classes receive a lower rating or are unrated.

Types of Risk

- *Interest-rate risk* — Like the prices of all fixed-income securities, the prices of ABSs fluctuate in response to changing interest rates in the general economy.
- *Credit risk* — Like other debt instruments, an ABS is evaluated and assigned a rating on the basis of its ability to pay interest and principal as scheduled. But unlike most corporate bonds, the ABS is secured by collateral and credit enhancements to further ensure that obligations are met.
- *Liquidity risk* — Compared to Treasuries and MBSs, many ABSs are not liquid, and their prices are not transparent partly because ABSs are not as standardized as Treasuries or even MBSs.
- *Prepayment risk* — Because the principal on the underlying debt may be repaid before it is due, determining the most likely prepayment scenario is critical to making an investment decision with a reasonable expectation about a security's life, which, in turn, affects the most likely yield.

8. Mortgage-Backed Security

What Is an MBS?

- An MBS is an ABS whose cash flows are backed by the principal and interest payments of a set of mortgage loans. As the underlying mortgage loans are paid off by homeowners, the investors receive payments of interest and principal.
- Investors in mortgage securities earn a coupon rate of interest, similar to other fixed-income securities, but also receive repayments of their principal in increments over the life of the security, as the underlying mortgage loans are paid off, rather than in

a single lump sum at maturity. Because the timing and speed of principal repayments may vary, the cash flow on mortgage securities is irregular.

- Mortgage securities play a crucial role in the availability and cost of housing in the United States. The ability to securitize mortgage loans enables mortgage lenders and mortgage bankers to access a larger reservoir of capital, to make financing available to home buyers at lower costs, and to spread the flow of funds to areas of the country where capital may be scarce.
- The majority of mortgage securities are issued or guaranteed by an agency of the U.S. government, such as Ginnie Mae, or by government-sponsored enterprises, such as Fannie Mae and Freddie Mac. These agencies buy qualified mortgage loans or guarantee pools of such loans originated by financial institutions, securitize the loans, and distribute the securities through the dealer community.
- Some private institutions, such as subsidiaries of investment banks, financial institutions, and home builders, also package various types of mortgage loans and mortgage pools. The securities they issue are known as “private-label” mortgage securities, in contrast to “agency” mortgage securities issued by Ginnie Mae, Fannie Mae, or Freddie Mac.

Common Mortgage-Backed Securities

- *Pass-throughs or PCs in the case of those MBSs issued by Freddie Mac* — Pass-throughs or PCs are the most basic mortgage securities, representing a direct ownership interest in a pool of mortgage loans. The issuer or servicer collects the monthly payments from the homeowners whose loans are in a given pool and “passes through” the cash flow to investors in monthly payments that represent both interest and repayment of principal. The pass-through structure reflects the fact that homeowners themselves do not pay the same amount each month. When issued, the stated maturity of pass-through securities is generally 30 years, although an increasing number may have 15-, seven- or five-year stated maturities.
- *Collateralized mortgage obligation (CMO) or real estate mortgage investment conduit (REMIC)* — PCs or pass-throughs may be pooled again to create the collateral for a more complex type of mortgage security known as a CMO or REMIC. CMOs and REMICs (terms which are often used interchangeably) can be structured to allow the cash flows to be directed to different classes of securities (tranches) with different maturities and coupons. As the payments on the underlying mortgage loans are collected, typically the CMO issuer first pays the coupon rate of interest to the bondholders in each tranche. All scheduled and unscheduled principal payments generated by the collateral, as loans are repaid or prepaid, go first to investors in the first tranches. Investors in later tranches do not start receiving principal payments until the prior tranches are paid off. This basic type of CMO is known as a “sequential pay” or “plain vanilla” CMO.
- Sometimes CMOs/REMICs are structured so that the prepayment, market risks, or both are transferred from one tranche to another. Prepayment stability is improved in some

tranches because other tranches absorb more of the risk of prepayment variability. Therefore, it is important to know the characteristics of other tranches in the offering before selecting a tranche as an investment.

- *Commercial mortgage-backed securities (CMBSs)* — CMBSs are a type of security backed by mortgages on commercial rather than residential real estate. CMBS issues are usually structured as multiple tranches, similar to CMOs, rather than typical residential pass-throughs. One of the key differences between CMBSs and other MBS types is that CMBSs usually have a lower degree of prepayment risk because commercial mortgages are often set for a fixed term.
- *Strips* — Stripped mortgage securities are created by segregating the cash flows from the underlying mortgage loans or mortgage securities to create two or more new securities, each with a specified percentage of the underlying security's principal payments, interest payments, or a combination of the two. Securities may be partially stripped so that each investor class receives some interest and some principal. When securities are completely stripped, all the interest is distributed to one type of security, known as interest-only (IO), and all the principal distributed to another, known as principal-only (PO).

Pricing and Markets

- As with any fixed-income security, the yield on a mortgage security investment depends on the purchase price in relation to the coupon rate and the length of time the principal is outstanding.
- Mortgage securities are sold and traded in terms of their assumed “average life” rather than their maturity dates. The average life is the average amount of time that will elapse from the date of MBS purchase until principal is repaid based on an assumed prepayment forecast. In other words, the average life is the average amount of time a dollar of principal is invested in an MBS pool.
- Prepayment assumptions generally assume that for new mortgage loans, the probability of prepayment increases as the mortgage ages, eventually reaching a constant rate around 30 months.
- Mortgage securities tend to carry higher coupon rates than do Treasuries. In part, this is because the interest rates charged on mortgage loans are higher than the interest rates charged to the U.S. government. But the higher rates on mortgage securities also reflect the level of investment risk created by the prepayment uncertainty.
- A national network of securities dealers sells, trades, and makes markets in mortgage securities. Mortgage securities transactions are executed OTC between dealers, rather than on an exchange.

Types of Risk

- *Interest-rate risk* — As with other fixed-income securities, mortgage securities' prices fluctuate in response to changing interest rates.
- *Credit risk* — As noted on Freddie Mac's Web site:¹

Ginnie Mae guarantees the timely payment of principal and interest on all of its pass-through and REMIC securities, and its guarantee is backed in turn by the full faith and credit of the U.S. government. [Fannie Mae and Freddie Mac, which have implicit guarantees from the U.S. government, guarantee] timely payment of both principal and interest on [their mortgage securities and PCs]. Private-label mortgage securities . . . are the sole obligation of their issuer and are not guaranteed by any governmental entity. However, many private-label CMOs are backed by pass-through securities issued or guaranteed by Ginnie Mae, Fannie Mae, or Freddie Mac.

Note that the credit risk of these securities and the guarantees underlying such securities would be further evaluated by taking into consideration the creditworthiness of Ginnie Mae, Fannie Mae, Freddie Mac, and the U.S. government.

- *Liquidity risk* — As noted on Freddie Mac's Web site:²

The high volume of outstanding mortgage securities, combined with the large number of investors who hold these securities, creates a sizable and active secondary market for mortgage pass-throughs. To a lesser extent, CMOs, and REMICs issued or guaranteed by Ginnie Mae, Fannie Mae, or Freddie Mac, and private-label mortgage securities are also traded in the secondary market.

- *Prepayment risk* — Because the underlying mortgages may be prepaid, the monthly cash flow of an MBS is not known in advance and presents an additional risk to the investor. Prepayment is classified as a risk for the MBS investor despite the fact that they will be repaid their investment because prepayment tends to occur when interest rates drop and the fixed income of the MBS would be more valuable. To compensate investors for the prepayment risk associated with MBS, they trade at a spread to government bonds referred to as an option-adjusted spread.

9. Auction-Rate Security

What Is an ARS?

- An auction-rate security (ARS) is a debt instrument with a long-term stated maturity; the issuer is not required to redeem the security until 20 to 30 years after issuance. However, for the investor, these securities have certain economic characteristics of short-term

¹ From "An Investor's Guide to Pass-Through and Collateralized Mortgage Securities." Available at http://www.freddiemac.com/mbs/docs/about_MBS.pdf.

² See footnote 1.

investments because of their rate-setting mechanism. The return on these securities is designed to track short-term interest rates through a “Dutch” auction process, which resets the coupon rate (or dividend rate). Auctions are typically held every one, seven, 28, 35, or 180 days with interest on these securities paid at the end of each auction period.

- Like many investment securities, the structure of any individual ARS can range from relatively simple, such as a single note underlying the security, to relatively complex, such as an ARS backed by multiple layers of securities having complex structures themselves.
- The auction process gives an investor three options at each remarketing date: (1) hold its ARS “at market” without participating in the auction process; (2) hold its ARS “at rate,” allowing the investor to participate in the auction process; or (3) tender its ARS, allowing the investor to sell its securities into the auction process provided that the auction does not fail. Existing investors that choose to hold their ARS “at rate” and potential new investors enter into a “blind” competitive-bid process in which they specify the lowest interest or dividend rate and quantity they are willing to accept. The lowest rate at which all of the securities can be placed (including to investors that choose the “at market” option) becomes the interest or dividend rate for these securities until the next auction date.
- A failed auction may occur if there is not sufficient demand for the ARS to allow existing ARS investors to liquidate their holdings in the auction process. For example, if there is a lack of demand for an ARS issuance and no rate is established in the auction process that would clear the entire issue, a failed auction would occur and current investors would be forced to continue holding their positions (generally, investors in a failed auction will receive a maximum predetermined interest rate from the issuer unless and until sufficient bids are received by the next auction date). In typical ARS issuances, investors cannot require the issuer to redeem the securities resulting from a failed auction.
- Issuers of ARSs include state and local municipalities, not-for-profit entities, corporations, utilities, student loan agencies, and taxable and tax-exempt closed-end municipal bond funds.

Common ARSs

- *Municipal ARSs* — These are tax-exempt or taxable municipal bonds issued by municipalities or their authorities with interest rates that are periodically reset through auctions. Municipal ARSs are backed by an underlying project or service revenue and are usually issued with maturities of 30 years, but maturities can range from five years to perpetuity.
- *Student loan auction rate notes (ARNS)* — This is a type of ABS issued by banks, for-profit and nonprofit student loan companies, and state agencies to provide low-cost financing alternatives for students by subsidizing lenders via government guarantees.

ARNS classified as Federal Family Education Loan Programs (FFELP loans) are 97 percent guaranteed by a state-designated guarantor plus ultimately guaranteed by the U.S. Department of Education (DOE). ARNS classified as private loans are issued to bridge the gap between the cost of education and existing FFELP maximum annual loan benefits. Private loans are not guaranteed by DOE and typically benefit from the guarantee of private companies or reserves pledged from securitization.

- *Auction rate preferred stock (ARPS)* — This is perpetual preferred stock of a closed-end municipal bond fund that pays dividends at rates set through auctions run by an independent auction agent. ARPS are backed by the underlying bond portfolio.
- *Asset-backed ARSs* — These are supported by underlying loan assets such as mortgage collateralized debt obligations (CDOs) (see the “Other Types of Securities” section below), credit card receivables, and commercial loans.

Pricing and Markets

- Auction rate products are designed to trade at par. Holders who submit sell orders in a successful auction will receive par plus accrued interest for their investment.
- Typically, credit ratings from the major credit agencies are high, generally because of bond insurance and other credit enhancements, such as overcollateralization.
- Ratings are based on the credit quality of each loan pool, taking into account credit enhancements, excess spread, and cash reserve funds. Credit enhancements used by issuers include senior/subordinate structure, reserve accounts, bond insurance, and excess spread.
- An investor may sell its ARS into the secondary market. However, when an auction has failed, the secondary market for the ARS may be inactive or nonexistent, and the fair value of the ARS may be less than par. Depending on market conditions and the underlying collateral of the ARS, the discount from par may be significant.

Types of Risk

- *Credit risk* — Credit risk associated with ARSs mirror those of other municipal and corporate issues in terms of default risk associated with the issuer. Because ARSs do not carry a “put” feature (which allows the bondholder to require the purchase of the bonds by the issuer or by a specified third party), they are very sensitive to changes in credit ratings and normally require the highest ratings (i.e., AAA, Aaa) to make them marketable. This is usually achieved with bond insurance.

- *Liquidity risk* — The ability of an investor to dispose of a share of an ARS may be largely dependent on the success of the auction. If an auction fails, holders who wished to sell their positions may be unable to do so. The issue would essentially become illiquid until a subsequent successful auction is conducted, the issuer redeems the issue, or a secondary market develops. The liquidity problems may have arisen because some broker-dealers who customarily placed bids for their own accounts in auctions did not place bids in recent failed auctions. However, broker-dealers are not legally required to bid in an auction.
- *Prepayment risk* — This is the risk that loans may be paid off earlier than expected. Borrowers can refinance at any time, in whole or in part, with no penalty. Low interest rates can cause voluntary prepayment speeds to increase.

10. Other Types of Securities

- *CDOs and collateralized loan obligations (CLOs)* — CDOs and CLOs are two types of ABSs and structured credit products. They have a structure similar to that of the CMOs (discussed above), but the assets securing the obligation are different. CDOs are backed by a pool of bonds, loans, and other assets; they do not specialize in one type of debt. CLOs, however, are backed with receivables largely from loans. CLOs effectively allow banks to reduce regulatory capital requirements by selling large portions of their commercial loan portfolios to the markets, thus reducing risks associated with lending. The ratings for CDOs and CLOs reflect both the credit quality of underlying collateral as well as how much protection a given tranche is afforded by tranches that are subordinate to it.
- *Variable rate demand obligation (VRDO) bonds* — VRDOs are an alternative to ARSs. A VRDO is a security for which the interest rate is reset periodically, typically through a remarketing process or according to a specified index. The bond's demand feature permits the bondholder to require the purchase of the bonds by the issuer or by a specified third party, (1) periodically, (2) at a certain time before maturity, or (3) when specified events or conditions occur. This process is often referred to as "putting" a bond or exercising a "tender option." Interest rates are generally based on market conditions and the length of time until the bondholder can exercise the put option. Because of the put feature, the VRDO normally requires a bank letter of credit. ARSs do not require a bank letter of credit because the investor does not possess a put option; rather, it relies on the liquidity generated by the Dutch auction process and the creditworthiness of the issuer or insurer. Although no letter of credit is required, most issues carry bond insurance to elevate them to the highest credit rating.
- *Money market fund* — A money market fund is a mutual fund that invests in short-term debt instruments. Money market funds seek to limit exposure to losses because of credit, market, or liquidity risks and maintain a stable \$1 net asset value. In the United States, money market funds are regulated by the Investment Company Act of 1940 and investments are restricted by quality, maturity, and diversity. Money market funds must maintain a weighted-average maturity (WAM) of 60 days or less and must be diversified

- in accordance with applicable SEC rules. Eligible money market securities include commercial paper, repurchase agreements, short-term bonds, or other money market funds.
- *Credit default swap (CDS)* — A CDS is a contract under which counterparties trade the credit risk of a third-party reference entity. Under a CDS agreement, a protection buyer pays a period fee to a protection seller in exchange for a contingent payment by the seller upon a defined credit event happening in the reference entity. When the credit event occurs, the protection seller either takes delivery of the defaulted bond for the par value or pays the protection buyer the difference between the par value and the recovery value of the bond. A CDS resembles an insurance policy in that it can be used by debt owners to hedge against credit events. However, because there is no requirement to actually hold any asset or suffer a loss, a CDS can be used to speculate on changes in credit. The cost to purchase a CDS varies as the perceived credit quality of the reference entity changes, with prices declining when creditworthiness improves and rising when it worsens.
 - *Floating rate note (FRN)* — An FRN is a bond that has a variable coupon (i.e., interest rate) equal to a money market reference rate, such as the London Interbank Offered Rate (LIBOR) or the federal funds rate plus a spread. Most FRNs have quarterly coupons (i.e., they pay interest quarterly). At the beginning of each coupon period, the interest rate for that period is calculated by adding the spread to the reference rate for that date. FRNs carry very little interest-rate risk because when market rates rise, the expected coupons of the FRNs rise accordingly. The risk that remains is credit risk. Securities dealers make markets in FRNs and trade over-the-counter.