Fixed Income Securities

Second Edition

Frank J. Fabozzi, Ph.D., CFA

JOHN WILEY & SONS
New York • Chichester • Weinheim • Brisbane • Singapore • Toronto

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To my wife, Donna,
and my children, Karly, Patricia, and Francesco

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About the Author

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Preface

The objective of this book is to provide comprehensive coverage of the wide range of fixed income securities. This includes a description of each security and its investment features and characteristics. While the majority of *Fixed Income Securities: Second Edition* is devoted to the securities, there is also an explanation of how securities are valued, yield and yield spread measures, interest rate risk measures, tax treatment, collateralized borrowing, and an overview of fixed income portfolio management and strategies.

Chapter 1 provides an overview of the features and risks associated with fixed income securities. These features include maturity, par value, the various types of coupon rates (fixed and floating), accrued interest, yield, provisions for paying off bonds before maturity (call and refunding provisions), and options granted to bondholders (put provisions and conversion provisions). Coverage of the risks associated with investing in fixed income securities include interest rate risk, call and prepayment risk, credit risk, liquidity risk, exchange rate risk, and inflation risk.

Chapter 2 explains how fixed income securities are valued and the various measures of interest rate risk. Valuation of fixed income securities involves estimating the cash flow from a security and then computing the present value of the estimated cash flow. The difficulty of estimating the cash flow for certain types of fixed income securities is explained. The two methodologies for computing the present value of the estimated cash flow—the traditional approach (which uses only one discount rate) versus the arbitrage-free approach (which uses multiple discount rates)—is discussed and illustrated. The interest rate risk measures explained are modified duration, effective duration, dollar duration, portfolio duration, contribution to duration, spread duration for fixed-rate bonds, index and spread duration for a floating-rate security, and convexity.

Yield and yield spread measures are covered in Chapter 3. The sources of return from investing in a fixed income security are first explained. Yield measures covered are current yield, yield to maturity, yield to first call, yield to next call, yield to first par call, yield to refunding, yield to put, yield to worst, and cash flow yield. The yield spread measures explained are nominal spread, zero-volatility spread, and option-adjusted spread. The margin or spread measures for floating-rate securities covered are the spread for life and the discount margin. Each measure is not only illustrated, but the limitations are highlighted. Also in Chapter 3 is an explanation of spot rates. These rates are used for computing the present value of the estimated cash flow using the arbitrage-free approach to valuation.

Chapters 4 through 14 cover the securities. Chapter 4 explains U.S. Treasury securities. These securities include Treasury bills, fixed-rate Treasury notes and bonds, and stripped Treasury securities. Federal agency securities are covered in Chapter 5. Federal agencies are categorized as either federally related institutions (i.e., arms of the federal government) or government-sponsored enterprises (i.e., privately owned but publicly chartered entities). The major issuer that falls into the federally related institutions category and whose securities are described in the chapter is the Tennessee Valley Authority. Government sponsored enterprises issue debentures and securities backed by loans. In Chapter 3 the various types of debentures are described. There are six government-sponsored enterprises that currently issue securities: Federal National Mortgage Association (Fannie Mae), Federal Home Loan Mortgage Corporation (Freddie Mac), Federal Home Loan Bank System, Federal Agricultural Mortgage Corporation (Farmer Mac), Federal Farm Credit System, and Student Loan Marketing Association (Sallie Mae). These entities are discussed in the chapter.

Chapter 6 covers securities issued by state and local governments, popularly referred to as municipal securities. The majority of these securities are exempt from federal income taxes and, as a result, appeal to investors that face a high marginal tax bracket. The tax provisions affecting municipal securities are discussed. The types of municipal securities include tax-backed debt (general obligation bonds, appropriation-backed obligations, dedicated tax-backed obligations, and debt obligations supported by public credit enhancement programs) and revenue bonds. Also described in Chapter 6 are hybrid municipal bond structures—insured bonds and refunded bonds—and municipal derivative securities.

Corporate debt obligations are covered in two chapters, Chapters 7 and 8. In Chapter 7 an overview of corporate bankruptcy and creditor rights is provided. After this overview there is a description of the various features of corporate debt obligations, including secured versus unsecured debt, indentures, and sinking fund provisions. The credit quality of corporate bonds are provided by organizations referred to as "rating agencies." Currently they include Fitch, Moody's Investors Service, and Standard & Poor's Corporation. These companies assess the credit quality of an issuer and cast their opinion in the form of a rating. These ratings are described in Chapter 7, along with an explanation of the rating process and the factors that are considered by rating agencies in assessing the credit risk of an issuer.

Speculative-grade corporate bonds (more popularly referred to as high-yield bonds or "junk" bonds), convertible bonds, medium-term notes, commercial paper, corporate bank loans, and preferred stock are described in Chapter 8. Default and recovery statistics, as well as the rights of creditors in bankruptcy versus what actually takes place in a bankruptcy, are also explained.

In Chapters 9, 10, and 11, securities backed by residential mortgages are described. These securities are popularly referred to as mortgage-backed securities. As explained in Chapter 9, the difficulty in analyzing any mortgage-backed security is due to prepayments. An investor who purchases a mortgage-backed security is exposed to prepayment risk. Chapter 9 describes various mortgage designs and the creation of the basic type of mortgage-backed product, the passthrough security. The passthrough securities issued by a federally related institution, the Government National Mortgage Association (Ginnie Mae), and two government-sponsored enterprises (Fannie Mae and Freddie Mac) are referred to as agency passthrough securities. Passthrough securities backed by residential mortgages that are issued by any entity other than Ginnie Mae, Fannie Mae, or Freddie Mac are referred to as nonagency passthrough securities. The focus in Chapter 9 is on agency passthrough securities. Passthrough securities backed by agricultural real estate are issued by Farmer Mac and are referred to as agricultural mortgage-backed securities.

From a mortgage passthrough security, two derivative mortgage-backed securities can be created—stripped mortgage-backed securities and collateralized mortgage obligations (CMOs). Stripped mortgage-backed securities include principal-only mortgage strips and interest-only mortgage strips. These securities and their risk characteristics are discussed in Chapter 9. In Chapter 10, CMOs that are issued by Fannie Mae, Freddie Mac, or Ginnie Mae are described, as well as the motivation for creating these securities. There are many types of CMO products created. These securities or bond classes are referred to as "tranches." They include sequential-pay tranches, accrual tranches, floating-rate tranches, inverse floating-rate tranches, planned amortization class tranches, support tranches, support tranches with schedules, and notional IO tranches. Each type of tranche is explained, as well as the exposure of each tranche type to prepayment risk.

In Chapter 11, nonagency mortgage-backed securities are covered. While both agency and nonagency mortgage-backed securities expose investors to prepayment risk, nonagency mortgage-backed securities also expose investors to credit risk. As a result, to obtain a rating for the tranches in a nonagency mortgage-backed security, it is necessary for the issuer to enhance the credit quality of the issue. The various ways in which a nonagency mortgage-backed security are credit enhanced and the important role of the servicer are described in the chapter.

Asset-backed securities are securities backed by a pool of loans or receivables. While technically mortgage-backed securities are asset-backed securities, in the United States there is a separation between the two. In Chapter 12, the features of asset-backed securities are explained—credit enhancement, amortizing versus nonamortizing assets, floating rate versus fixed rate, passthrough versus paythrough, and optional clean-up call provisions. Then several types of products are reviewed—home equity loan-backed securities, manufactured housing-backed securities, commercial mortgage-backed securities, auto loan-backed securities, SBA loan-backed securities, and credit card receivable-backed securities. The unique risks associated with investing in asset-backed securities are asset risks, structural risks, the risks associated with the legal structure, and the risks associated with third-party providers. These risks are explained in the chapter.

A major sector of the asset-backed securities market is the market for collateralized debt obligations (CDOs). These are securities backed by a pool of debt obligations consisting of one or more of the following: high-yield corporate bonds, emerging market bonds, bank loans, special situation loans, distressed debt, or tranches of asset-backed or mortgage-backed deals. When a CDO includes only bonds as collateral, the issue is referred to as a collateralized bond obligation; a CDO is referred to as a collateralized loan obligation if the collateral consists of only loans. Chapter 13 describes CDOs—their structure and the types of transactions (arbitrage versus balance sheet), and cash flow versus market value transactions.

Chapter 14 reviews the various types of international bonds. The chapter begins with foreign exchange rates and a classification of trading blocs. Then the different types of international bonds are described: foreign bonds, Eurobonds, and global bonds. Coverage of central government securities includes the methods of distribution, special structures in emerging market government bonds, accrued interest and market conventions, and credit risk.

An investor seeking to borrow funds to invest in the bond market can do so by means of a collateralized loan. This means that the collateral for the loan is a bond that is owned or one that is being purchased with the borrowed funds. The most common mechanism used by institutional investors is the repurchase agreement. A specialized type of repurchase agreement used for passthrough securities is the dollar roll. For retail investors, the most common type of collateralized borrowing is the purchase of securities on margin. In Chapter 15, these various forms of collateralized borrowing are explained. Since a collateralized borrowing may result in leveraging a portfolio, the chapter begins with the principles of leverage—the advantages and disadvantages of using leverage. Securities lending is a way in which an entity can borrow securities and is described in the chapter.

The federal income tax treatment of transactions in the fixed income securities market are reviewed in Chapter 16. Specifically, the following are covered: different definitions of income as specified in the tax code, tax basis, capital gain or loss, and tax treatment of capital gain or loss. The tax law dealing with the treatment of interest income is complex when securities are not purchased at par value. The rules are described in the chapter.

Chapters 17 and 18 provide an overview of fixed income portfolio management for institutional investors. An overview of the investment management process is provided in Chapter 17. The five steps in this process are (1) setting investment objectives, (2) establishing investment policy, (3) selecting the portfolio strategy, (4) selecting the assets, and (5) measuring and evaluating performance. In the discussion of the fifth step, there is coverage of the various methodologies for measuring the performance of a portfolio manager—arithmetic average rate of return, time-weighted rate of return, and dollar-weighted rate of return. The various types of bond indexes—broad-based U.S. bond market indexes, specialized U.S. bond market indexes, and global and international bond indexes—are then reviewed. The chapter concludes with a framework that should be used by portfolio managers in assessing the potential performance of a portfolio, total return.

An overview of fixed income portfolio strategies is the subject of Chapter 18. The strategy pursued by a manager will either be an active or passive strategy. The decision as to whether to pursue an active or passive strategy will be based on whether the manager (or client) believes that the bond market or a sector of the bond market is price efficient. Consequently, the chapter begins with the concept of the pricing efficiency of a market and its implications for portfolio strategy selection. Then a classification of strategies that a portfolio manager can pursue given a benchmark, as suggested by Kenneth Volpert of the Vanguard Group, is provided—pure bond indexing, enhanced indexing/matching primary risk factors, enhanced indexing/minor risk factor mismatches, active management/large risk factor mismatches, and active management/full-blown active. The primary risk factors associated with an index are explained. Value-added strategies are then described—strategic strategies (interest rate expectations strategies, yield curve strategies, and inter- and intra-sector allocation strategies) and tactical strategies. The motivation for international bond investing is then provided, as well as a framework for formulating a strategy for international bond investing. The chapter concludes with a description of strategies that institutional investors employ to manage a portfolio where the objective is to satisfy liabilities. These strategies are referred to as structured portfolio strategies and include immunization and cash flow matching.

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