CHAPTER 1

Introduction

In the credit market, banks, and brokers raise debt capital for corporate entities that need funds for a variety of reasons such as working capital needs, merger and acquisition activities, share buybacks, and capital expenditures. Capital can be raised via various debt instruments, but primarily through bonds and loans.

One segment of the overall credit market, the leveraged finance market, is comprised of market participants (i.e., issuers and investors) with somewhat unique needs. With regard to issuers, these unique needs result from the fact that they have, or desire to have, a proportionally large amount of debt relative to a "normal" corporate capital structure. An issuer in the leveraged finance market is usually considered more risky than a company with a more balanced capital structure and, as a result, has a relatively low credit rating. Issuers in the leveraged finance market are companies that issue debt and have a credit rating below investment-grade (below BBB–/Baa3).

Of course, investors in the leveraged finance market expect that with more risk comes more return potential. Investors range from hedge funds to insurance companies, but the one common thread shared by all leveraged finance investors is that they all have relatively high return objectives. In the past, the assets within the leveraged finance market fell into one of two categories: cash bonds or cash loans. But this has changed. With the introduction of products such as credit default swaps, synthetic indexes, and tranching of the indexes, leveraged finance investors have many tools to work with and assets to consider.

This book attempts to tie the various pieces that comprise the leveraged finance market together. Its 14 chapters are divided into five parts:

Part One: The Cash Market
Part Two: The Structured Market
Part Three: The Synthetic Market
Part Four: How to Trade the Leveraged Finance Market
Part Five: Default Correlation

PART ONE: THE CASH MARKET

Part One addresses the cash markets, which include high-yield bonds (also referred to as speculative-grade or junk bonds), and leveraged loans.

Chapter 2 focuses specifically on the *high-yield bond market*. This market segment has been evolving dramatically, which makes understanding the basics of this space so important. This chapter provides an overview of the high-yield space, details some specific changes in the landscape, such as bond structures and the size and growth of the market. It also addresses topics such as ratings transitions, risk and returns, and recovery prospects in the event of default.

Chapter 3 focuses on the *leveraged loan market*. A leveraged loan is one extended to a speculative-grade borrower (i.e., a borrower rated below investment-grade, or below BBB–/Baa3). When market participants refer to "loans," they generally mean broadly syndicated (to 10 or more bank and nonbank investors) leveraged loans. They also typically mean senior secured loans, which sit at the topmost rank in the borrower's capital structure, and generally, they mean larger loans to larger companies.

Loans are a key part of financing packages by companies rated below investment-grade. Debt capitalization for a typical credit in the leveraged finance space is about 65% to 70% loans and 30% to 35% bonds, although variations can be significant. The investor base in the leveraged loan market has been in flux since the end of 2007, with a number of nontraditional investors looking to get in (e.g., equity funds, distressed investors, private equity) and others trying to trim exposure (e.g., select hedge funds). In Chapter 3, we provide an overview of the loan market, with topics including a description of a typical loan, changes in market dynamics, and a discussion of emerging trading strategies.

PART TWO: THE STRUCTURED MARKETS

Part Two takes a look into the structured market, focusing on one type of collateralized debt obligation—*collateralized loan obligations* (CLOs). *Collateralized loan obligations* (CLOs) have been around for over 20 years and until September 2007 bought two-thirds of all U.S. leveraged loans. A CLO issues debt and equity and uses the money it raises to invest in a portfolio of leveraged loans. It distributes the cash flows from its asset portfolio to the holders of its various liabilities in prescribed ways that take into account the relative seniority of those liabilities.

In Chapter 4, we look at the general CLO market characteristics and their relationship with leveraged loans. A CLO can be well described by focusing on its four important attributes: assets, liabilities, purposes, and credit structures. Like any company, a CLO has assets. With a CLO, these are usually corporate loans. And like any company, a CLO has liabilities. With a CLO, these run the gamut of equity to AAA rated senior debt. Beyond the seniority and subordination of CLO liabilities, CLOs have additional structural credit protections, which fall into the category of either cash flow or market value protections. Finally, every CLO has a purpose that it was created to fulfill, and these fall into the categories of arbitrage or balance sheet. In this chapter, we look in detail at the different types of assets CLOs hold, the different liabilities they issue, the two different credit structures they employ, and, finally, at the two purposes for which CLOs are created.

Chapter 5 runs through collateral overlap among CLOs. If you are an investor in the leveraged finance market and have the feeling that you've seen a CLO's collateral portfolio before, it's because you probably have. CLO portfolios, even from CLOs issued in different years, tend to have a lot of underlying loan borrowers in common. This is in part the result of loan repayments causing CLO managers to continually be in the market buying loans for their CLOs. Also in this chapter, we look at collateral vintage, and find that different vintage CLOs have similar collateral. In this chapter, we first present several measurements related to collateral overlap and single-name concentration. We look at collateral overlap between individual CLOs, between CLO managers, and between CLO vintages. Next,

we look at the most common credits across CLOs and across CLO managers. Finally, we look at the relative risks of collateral overlap and single-name concentration.

Chapter 6 addresses the resiliency of CLO returns to defaults and recoveries. With the help of Moody's Wall Street Analytics, we analyze 340 CLOs issued from 2003 to 2007. We tested CLOs in the worst default and recovery environment U.S. leverage loans have experienced since the inception of the market in 1995. On average, every vintage and rating down to Ba2 returns more than LIBOR, even if purchased at par. We also tested CLO debt tranches in a "Great Depression" high-yield bond default and recovery scenario. On average, Aaa, Aa2, and most A2 tranches still return more than LIBOR, even if purchased at par.

We also discuss distressed loan prices, overflowing triple-C buckets and CLO returns. When market participants model CLO returns, they focus primarily on defaults and recoveries. But since the recent dislocation in the credit markets, two other factors demand attention: the size of the CLO's triple-C asset bucket and the price at which the CLO reinvests in new collateral loans. This chapter looks at the separate and joint effects of reinvestment prices and triple-C buckets on different CLO tranches. Then, it goes through each CLO tranche and looks at the joint effects.

PART THREE: THE SYNTHETIC MARKETS

Part Three introduces the relatively young *synthetic markets*, which include *credit default swaps* (CDS), the traded credit indexes, and index tranches. Credit default swaps enable the isolation and transfer of credit risk between two parties. They are bilateral financial contracts which allow credit risk to be isolated from the other risks of an instrument, such as interest rate risk, and passed from one party to another party. Aside from the ability to isolate credit risk, other reasons for the use of credit derivatives include asset replication/diversification, leverage, yield enhancement, hedging needs, and relative value opportunities. Like Part One, we start with the basics.

Chapter 7 discusses credit default swaps. The CDS market has grown tremendously since 1996 in terms of both trading volume and product evolution. The notional amount of outstanding CDS rose

from $20 billion in 1996 to over $54 trillion through the first half of 2008. In terms of product evolution, the market has developed from one that was characterized by highly idiosyncratic contracts taking a great deal of time to negotiate into a standardized product traded in a liquid market offering competitive quotations on single-name instruments and indexes of credits.We begin the chapter with a brief introduction to credit default swaps on specific corporate issuers, including how they work, who uses them, and what are they used for.

Also in Chapter 7, we discuss the *credit indexes*. Predefined, single-name CDS contracts are grouped by market segment, specifically the high-yield bond segment (the high-yield index is denoted CDX. HY) and the loan segment (index denoted LCDX). The core buyers and sellers of the indexes have been index arbitrager players, correlation desks, bank portfolios and proprietary trading desks, and credit hedge funds. Increasingly, greater participation by equity and macrohedge funds has been observed. These investors are looking for the following from the indexes: a barometer of market sentiment, a hedging tool, arbitrage and relative value positioning, and capital structure positioning.

Understanding the credit indexes is critical for Chapter 8, which covers *index tranches*. Similar to the proceeding chapters in Part Three, we walk through the basics of the market, and how and why it came into existence.

PART FOUR: HOW TO TRADE THE LEVERAGED FINANCE MARKET

Part Four reviews how investors can trade within the leveraged finance market.

In Chapter 9, we assess return prospects in the high-yield market during economic downtowns. In order to do so, we examine the relationship between economic growth and valuations during the five most recent recessions prior to the current downturn. In particular, we evaluate the performance of each heading into, during, and following the official recessionary period. In addition to looking at the performance at the broad market level, we review the performance at the sector level and across rating categories.

Chapter 10 provides a framework for credit analysis of corporate debt and explains how credit analysis is more than just the traditional

analysis of financial ratios. This is particularly true when evaluating high-yield borrowers.

Chapter 11 introduces "the basis," that link between the cash markets (bonds and loans) and the synthetic markets (CDS and indexes). Understanding the basis is important for many reasons. For one, it serves as a simple reference point between the valuations of each market. As such, it can guide an investor as to where to find attractive value when looking to add or reduce exposure to a particular issuer. Also in this chapter, we walk readers through gauging the basis and how to construct basis packages to take advantage of dislocations between the cash and synthetic markets.

Chapter 12 takes a look at how much investors should be paid to take risk. In this chapter, we present four types of risk: single-name credit risk (i.e., compensation for exposure to a particular issuer); curve risk (i.e., compensation for long/short positions on the same issuer's credit curve); basis risk (i.e., compensation for long/short combinations expressed in the cash and synthetic markets, expanding on the topic addressed in Chapter 11); and capital structure risk (i.e., compensation for long/short combinations among different liabilities of the same issuer).

PART FIVE: DEFAULT CORRELATION

Part Five addresses *default correlation*. Default correlation is the phenomenon that the likelihood of one obligor defaulting on its debt is affected by whether or not another obligor has defaulted on its debts. A simple example of this is if one firm is the creditor of another—if Credit A defaults on its obligations to Credit B, we think it is more likely that Credit B will be unable to pay its own obligations.

Chapter 13 covers the basics of default correlation. In this chapter, we provide a not overly mathematical guide to default correlation. We define default correlation and discuss its causes in the context of systematic and unsystematic drivers of default. We use Venn diagrams to picture default probability and default correlation, and provide mathematical formulas for default correlation, joint probability of default, and the calculation of empirical default correlation. We emphasize higher orders of default correlation and the insuffi-

ciency of pair-wise default correlation to define default probabilities in a portfolio comprised of more than two credits.

Chapter 14 looks at empirical default correlations using company- and industry-specific issues that could lead to default. In this chapter, we explain the calculation and results of historic default correlation. We show that default correlations among well-diversified portfolios vary by the ratings of the credits and also by the time period over which defaults are examined. We describe two major problems in measuring default correlation and therefore implementing a default correlation solution: (1) There is no way to distinguish changing default probability from default correlation; and (2) the way default correlation is commonly looked at ignores time series correlation of default probability. We discuss the various ways analysts have attempted to incorporate default correlation into their analysis of credit risky portfolios, such as the (in our view) antiquated method of industry and single-name exposure limits, Moody's ad hoc method of assessing the trade-off between industry and single-name diversity in their Diversity Score, the changing-default probability approach of Credit Suisse, and the historical market value approach of KMV. Also in this chapter, we question whether any default correlation modeling is necessary when comparing well-diversified portfolios. Given a certain level of single-name and industry diversity, we doubt that typical portfolios have very different default correlations and we are skeptical of any measurement showing that they do. However, we do see value in creating default probability distributions.