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Rating Methodology

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RATING METHODOLOGY

The Evolving Meaning Of Moody's Bond Ratings

Product Of The Symbols And Definitions Standing Committee

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Summary

In 1909, John Moody introduced a simple grading system for railroad bonds that summarized multidimensional features of credit quality – financial strength, default frequency, loss severity, and transition risk. As his ratings were applied to other bond market segments, the relative emphasis on the different aspects of credit quality varied to meet the expectations of investors in these different markets. While investors historically welcomed – and, in fact, demanded – market specific definitions of credit quality, the value placed on these distinctions by the capital markets has been diminishing as the historical segmentation of bond markets erodes. For the past two decades, Moody’s has taken steps to achieve greater comparability across markets by increasingly emphasizing the expected loss rate – the product of the expected default rate and loss severity – as the primary measure of credit quality. However, in response to the needs of investors who are highly sensitive to default and transition risk, Moody’s will continue to overweight those aspects of credit risk in certain sectors.

Why Might Ratings Appear To Have Different Meanings In Different Sectors?

Moody’s ratings are intended to provide capital market participants with a framework for comparing the credit quality of debt securities. A credit rating compresses an enormous amount of diverse information into a single symbol. Credit quality embraces relative default probability, loss severity, “financial strength,” and “transition risk.”¹ Bonds with the same credit rating, therefore, may be comparable with respect to overall credit quality but may differ with respect to specific credit quality characteristics.

Credits in a number of segments frequently rely for their credit standing upon implicit third-party support. While such support may be highly likely and predictable, it is not guaranteed. Consequently, while the average expected loss associated with such segments may be very low, individual credits may default from time to time if the expected rescue fails to materialize. There is thus a natural tendency to discount such implicit support and to “overweight” the credit’s stand-alone financial strength. This reflects the market’s perceived aversion to event risk, the possibility that a single event (in this case the withdrawal of third-party support) can cause a large change in credit quality, or even an outright default, without first “transitioning” gradually through lower rating categories. Thus, expected loss rates in such segments will tend to be lower by rating category than for segments in which financial strength and expected loss are more highly correlated. (Some investors have in fact criticized the rating agencies for giving any weight at all to implicit third-party support, arguing that ratings should only reflect intrinsic strength. We choose to give analytical weight to such support because it influences expected loss.)

Within a given market sector, bonds with the same rating tend to be quite comparable both with respect to overall credit quality and specific credit quality characteristics. To obtain a consistent framework of relative credit quality within a specific sector, ratings need only correlate closely with the likelihood of default, because the expected severity of loss in the event of default, ratings volatility, and transition risks are generally uniform across issuers. However, the relative influences of these aspects of credit quality vary across and within certain segments of the bond market.

The US bond market has historically been segmentable into at least four sectors – corporates, municipals, investor-owned utilities, and structured finance. Individual investors often purchase and borrowers often issue in just one – and rarely all – of these sectors. The securities issued in these markets have differed in many respects, such as liquidity, price volatility, and the timing of cash flows. However, perhaps the most important distinction is that the default experience and credit losses within a given rating category have historically varied across these markets reflecting the fact that investors in the various markets have historically had fairly distinct credit concerns, and that Moody’s has responded (as have other rating agencies) by incorporating these different concerns into rating assignments.

Moreover, within these segments, investors wanted ratings to provide as much differentiation as possible. In its rating assignments, therefore, Moody’s historically often emphasized the ordinal

¹ Financial strength refers to intrinsic creditworthiness, which abstracts from potential (and uncertain) external support elements (such as a rescue by a third party). Transition risk, refers to uncertainty with respect to the levels and timing of credit events: high transition risk credits have relatively high probabilities of large rating movements. Examples of sectors subject to high transition risk are banks, sovereigns, investor-owned utilities and local government authorities. Issuers in these sectors derive significant credit strength from external sources of support: bank regulators, multilateral institutions, rate commissions and state governments. Furthermore, confidence-sensitive issuers with high levels of short-term funding, such as securities firms, also face high transition risk.

ranking of credit risk within each sector, rather than comparability across sectors. Consequently, a large portion of the rating scale was employed in each sector, even if the result was that the lowest rated credits in one sector were more creditworthy than similarly rated credits in other sectors. Inevitably, this segmentation ran the risk of exaggerating credit risk in some segments and of reducing comparability of ratings across segments.

In the corporate sector, defaults have been relatively common but loss severity has been unpredictable. The bulk of investment-grade corporate bonds has long been held by institutional investors, who are generally averse to default risk (irrespective of severity) but nonetheless have an overall expected-return orientation. Responding to the needs of such investors, Moody's ratings on industrial and financial companies have primarily reflected relative default probability, while expected severity of loss in the event of default has played an important secondary role. In the speculative-grade portion of the market, which has been developing into a distinct sector, Moody's ratings place more emphasis on expected loss than on relative default risk.

In the structured finance sector, where default probabilities and expected loss severity are often estimated through statistical analysis, ratings have placed greater emphasis on the expected loss concept, which places roughly equal weight on default probability and loss severity. The largest institutional investors – who tend to take a highly sophisticated approach to the assessment of expected loss – have dominated this market from its inception. While these investors are not wholly indifferent to pure default risk, many investors focus on the expected return of their portfolio. The characteristics of the asset pools that are typically securitized lend themselves to statistical analyses in which expected loss is a natural output. Moreover, because of the ability to divide a structured security into multiple tranches, this market is better served by ratings that place a heavy emphasis on expected investor loss.² The low transition risk of securities backed by pooled assets confirms the usefulness of this approach. Moody's structured finance ratings, however, are not based “purely” on the expected loss concept. For example, investment-grade tranches with relatively high probabilities of default but extremely low expected loss severity are typically assigned ratings that are somewhat lower than would be implied by a simple expected loss calculation.

Standing in even greater contrast to corporate ratings, the ratings assigned to the general obligations of U.S. municipalities were historically intended to differentiate based upon relative financial strength (as measured by traditional statistical ratios), which was not necessarily reflected in historical measures of default risk or expected loss. When originally assigned by John Moody in the first decades of this century, Moody's municipal ratings had separate definitions but used the same symbols as corporate ratings. Corporate and municipal ratings were seen as distinct systems with separate meanings. While their meanings continue to contain some differences, they are more closely aligned today than they were twenty years ago as certain subsectors within the municipal market have developed more corporate-like risk profiles. Examples of obligations issued in these subsectors include industrial revenue bonds, issues backed by multi-family units, healthcare bonds and certain tax-exempt project financings.

Moody's municipal ratings were principally intended to serve retail investors seeking tax-exempt interest income. U.S. municipal investors have historically sought risk distinctions among bonds within a narrow band of default risk and loss severity, because compared to the corporate bond default experience, post-War municipal bond defaults have been extremely rare and recoveries in the event of default have been quite high.³ Local governments facing impending financial crises have often received state-level support that has averted defaults. In the event of default, municipalities have rarely declared bankruptcy, and their debt service payments have generally been resumed quickly, often with little loss of principal, or even interest, to investors. However, despite the relatively small expected-loss content of municipal bonds, investors remain exposed to substantial price risk, particularly where liquidity is low or where the issuer's financial condition and public support are at issue.

A rating system has evolved for public finance obligations that places considerable weight on an overall assessment of financial strength or credit quality. Prior to the Tax Reform Act of 1986, municipal investors were largely individuals and banks who demanded a ratings emphasis on issuer financial strength

2 Suppose an asset-backed security rated single-A is divided into two tranches, one senior and one subordinated. The riskiness of the junior tranche is clearly greater than the riskiness of the original, undivided security, although they share the same default frequency. If the emphasis were on default risk alone, they would share the same rating.

3 Even during the Depression, municipal credit losses were, on average, lower than those experienced in the corporate sector, as indicated in George Hempel's study of Depression-era municipal defaults, *The Post-War Quality of State and Local Debt*, (NBER, 1971). Between 1929 and 1937, when 4,770 state and local governments defaulted on \$2.85 billion, or 15.4% of the average municipal debt then outstanding, recovery was high and relatively rapid.

because they were often poorly diversified, concerned about the liquidity of their investments, and in the case of individuals, often dependent on debt service payments for income. Consequently, the rating symbols have taken on somewhat different meanings in response to different investor expectations and needs. The different meanings account for different default and loss experience between similarly rated bonds in the corporate and municipal sectors.

Since 1986, the U.S. municipal market has undergone dramatic change. Mutual funds, which purchase both taxable as well as tax-exempt issues and often actively trade their positions, are now major investors. More U.S. municipal issuers now issue taxable securities and use structured finance technology. In short, some of the historical distinctions between the municipal and corporate markets continue to blur, and therefore the value of greater consistency between the ratings of these major segments is increasing.

Similarly, Moody's bond ratings for regulated operating companies of investor-owned utilities have historically placed greater weight on financial measures rather than expected loss when compared to corporate bonds. Because of regulatory support, utility bonds have rarely defaulted. While some utilities have suffered financial distress through a combination of poor decision making on their part and lack of support from regulators for those decisions, the few that have declared bankruptcy have received enough support from regulators to allow them to continue paying debt service even when they have not been legally obliged to do so. The regulatory safety net in the utility sector provides similar flexibility to the municipal sector where political decisions can support municipal bondholders to avoid certain adverse financial situations. Here again, market requirements encouraged the development of a separate scale that placed greater weight on financial ratios than on expected loss.

Sectoral Distinctions Likely To Continue Diminishing Over Time

The value placed on market-specific definitions of credit quality has been diminishing as bond markets converge. Bond market segmentation is being eroded by crossover investors and the designers of structured finance/arbitrage vehicles. Public entities are issuing debt in the taxable as well as the tax-exempt markets, and individual investors now frequently purchase both taxable and tax-exempt securities. Moreover, the differences in risk characteristics between bond issues of regulated utilities and those of other corporations are rapidly disappearing as a result of market deregulation, technological change, and increased competition.

The need for a unified rating system is also reflected in the growing importance of modern portfolio management techniques, which require consistent quantitative inputs across a wide range of financial instruments, and the increased use of specific rating thresholds in financial market regulation, which are applied uniformly without regard to the bond market sector.

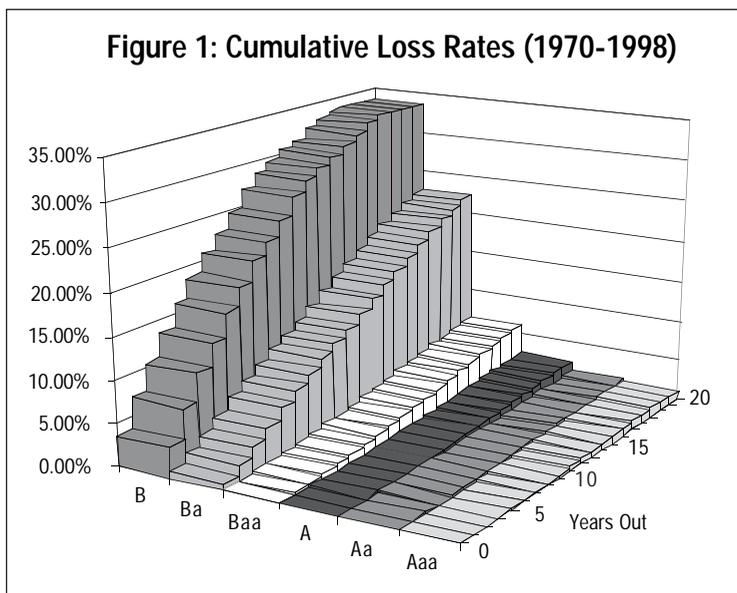
Separate rating systems with different implied expected loss levels may increasingly lead to sub-optimal investment decisions in the future by market participants investing in multiple asset classes, and the risks of rating and regulatory arbitrage are rising. Where the need for consistency is most immediate, Moody's already makes some allowance for the different expected loss content of similarly rated municipal, utility, and corporate bonds in the models employed to determine ratings on structured pools of corporate and municipal obligations and to measure the capital adequacy of the monoline financial guarantors.

Emphasis On Expected Loss Is Increasing

In anticipation of the changing needs of increasingly sophisticated investor constituencies, Moody's has, since the early 1980's, increased the weight assigned to expected loss in rating determinations. As market segmentation continues to decline and market efficiency increases, expected loss has become the dominant consideration in bond pricing. However, because of the bond investor's continuing aversion to default, irrespective of severity, default probability and transition risk will continue to receive greater weight, particularly in the investment-grade sector, than a pure expected loss methodology would suggest.

Moody's corporate bond default studies show that average loss rates by rating category rise as the investment horizon extends (see Figure 1). Nonetheless, in applying the expected loss framework, Moody's will continue to rate obligations without respect to maturity. In other words, a single rating is applied to all similar bond issues of an individual issuer despite different durations, and we do not upgrade bonds as they near maturity even though their expected loss rates

decline. Individual rating categories are not, therefore, associated with a single expected loss rate. Instead, each rating category is associated with a *schedule* of expected loss that varies by *time horizon*. Our structured finance rating methodology employs loss schedules that are idealizations of this historical loss experience. However, the expected loss profile of any single bond is unlikely to precisely match these idealized schedules.

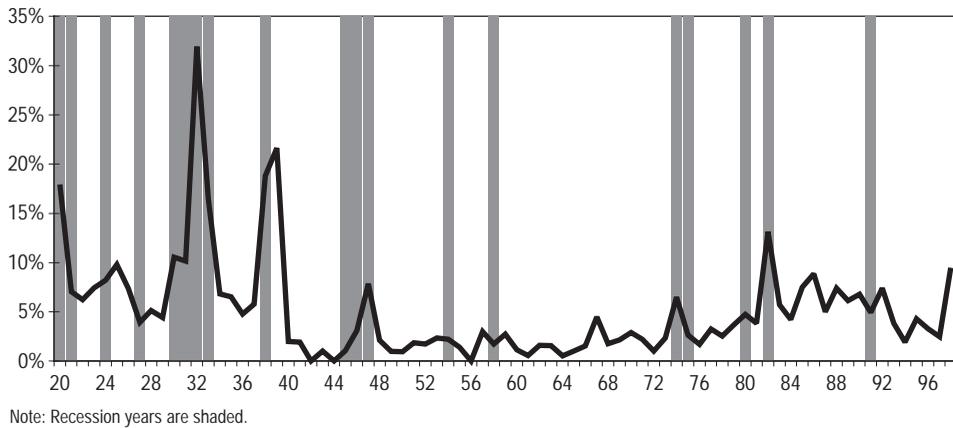


Ratings And The Business Cycle

How should changes in macroeconomic conditions be reflected in Moody's ratings? A rating agency cannot realistically be expected to be able to precisely anticipate future changes in macroeconomic conditions (in 100 countries). As a consequence, we expect that actual, measured default rates by rating category will exhibit pronounced cyclical patterns, rising in recessions and falling in recovery. Therefore, while it is impossible to produce constant *realized* default rates, one of Moody's goals is to achieve stable *expected* default rates across rating categories and time. Yet this goal must be balanced against practical considerations as well as some investors' preference for ratings that are stable through business cycles.

When faced with a change in the economic environment, bond ratings could be adjusted to reflect the impact, if any, on credit quality. In general, when an economy shifts into recession (the timing and severity of which inevitably is a surprise), if ratings are unchanged, expected loss rates would likely increase by rating category. To maintain constant expected loss rates by rating category, rapid wholesale rating downgrades would be required in recessions. It is not at all clear that the market would welcome such actions. Nonetheless, while it is difficult to evaluate the credit implications of changing economic conditions, Moody's has been striving for some time to increase the responsiveness of its ratings to economic developments. As a result, over the past two decades, Moody's ratings changes have shown a more pronounced cyclical pattern, one that is roughly consistent with the credit cycle (See Figure 2).

Figure 2: Yearly Percent Of A-Rated Issuers Downgraded To Baa



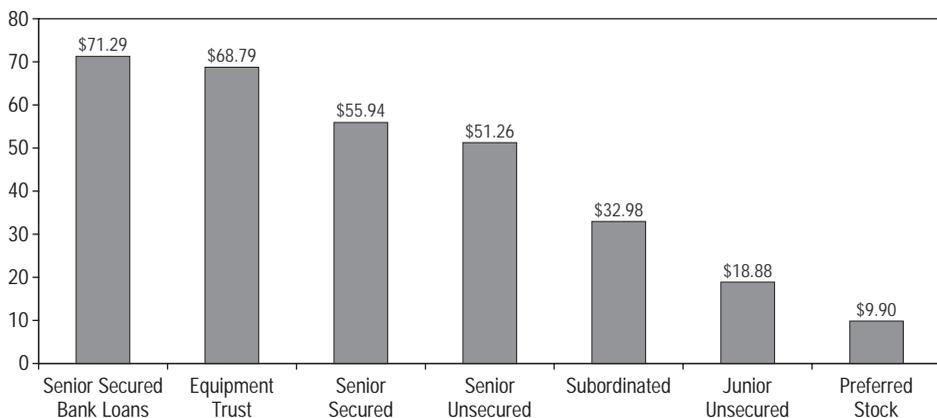
Nevertheless, Moody’s believes that giving only a modest weight to cyclical conditions best serves the interests of the bulk of investors. Investment-grade issuers presumably possess sufficient financial strength to weather a recession. If downgraded upon entering a recession, such entities would most likely have their ratings upgraded upon recovery. Many investors would find the resulting rating volatility disruptive. Consequently, for investment grade issuers in particular, Moody’s ratings do not automatically change with business cycles.⁴

Some portfolio investors who are particularly concerned with short-term financial results, however, may desire a rating system that maintains constant expected loss rates over business cycles. Their needs can be met by using additional quantitative tools. Modern statistical methods have been developed to estimate cyclical and cross-sectoral variations in expected loss rates. Such estimates can be used to complement the information content of traditional ratings for portfolio management purposes.

Subordinated Debt And Preferred Stock Ratings

Propagation of the expected loss methodology has required adjustments not only with respect to the integration of historically distinct market segments, but also with respect to rating practices concerning different classes of securities.

Figure 3: Average Recovery Rates By Seniority And Security



⁴ It is difficult to evaluate the effects of the business cycle on the credit risk of individual issuers. In some paradoxical cases, the long-term prospects of certain investment-grade corporate issuers actually improve, following recessions in which weaker competitors suffer disproportionately.

Our desire to place greater emphasis on expected loss in the management of Moody's rating systems has required a review of our historical practices with respect to the assignment of subordinated debt and preferred stock ratings. Since 1909, Moody's has typically rated subordinated debt at least "one notch" below senior debt. Prior to the numeric refinement of Moody's bond ratings in 1982, this meant that subordinated debt was rated the equivalent of at least three refined notches below senior debt; since then the differential has been narrowed to one refined notch for issuers with investment-grade senior debt and up to three notches for issuers with speculative-grade senior debt. This rating differential reflected the expectation of relatively greater loss severity for subordinated debt. in the event of default (See Figure 3). However, in certain cases, these conventions may not be justified on an expected loss basis. Consequently, we expect to continue to selectively narrow the senior/subordinated differential where appropriate.

The issues surrounding preferred stock ratings are more complex. Moody's has maintained a separate rating system (using different symbols) for preferred stock since 1973. Consequently, our preferred stock ratings are not intended to be comparable with the bond rating scale. Expected loss by category is much higher for preferred stock than for bonds, which is acceptable given the fact that the systems are separate. However, there has been a natural tendency in the marketplace to assume that the systems fit together. Consequently, viewed in this light, our preferred stock ratings are "too high" relative to senior and subordinated debt. Although we have gone to considerable lengths to explain that the systems are separate, some ambiguity remains. Consequently, we will continue to widen the rating "differentials" between senior debt and preferred stock, with the ultimate intention of unifying the systems at some point in the future. It should be emphasized that, until the systems are unified, they should continue to be understood as separate systems with different meanings.

Toward Consistency In Ratings

As segments of the bond market continue to converge, and investors demand greater consistency in the meaning of ratings across sectors, Moody's will continue to increase the weight given to the expected loss rate in assessing credit quality. Accumulating historical data will provide researchers the opportunity to examine Moody's record in achieving this goal – through studies of default, loss and transition events across rating categories, sectors, time horizons and geographies. Some of these results may raise concerns about consistency in the application of our ratings and their meanings. As this paper argues, some of the apparent discrepancies will result from differences in the intended meanings of our ratings. Although some apparent discrepancies may be the result of statistical sampling shortcomings, certain others will indeed be unintentional, suggesting that a sector has proven more or less risky than anticipated. We will continue to rely on historical statistical measures to conduct self surveillance in order to identify and explain or correct such anomalies.

Already, Moody's has taken a number of steps to improve rating comparability by focusing on expected loss in those markets where such a concept is consistent with market expectations. Moody's continues to refine and to extend our published historical studies of defaults and losses. The meaning and significance of these statistics are communicated to rating analysts. Furthermore, we compare rating trends across sectors and conduct quantitative assessments of rating consistency through the application of statistical rating methods.

In order to promote consistent rating practices, analysts from different rating groups often participate in rating committees and experienced analysts and managers are rotated across rating groups. In addition, best practices are summarized and distributed by a Standing Committee system that reviews issues that are relevant to multiple rating groups. Finally, Moody's Chief Credit Officer is responsible for approving all rating practices and ensuring their consistent application across the franchise.

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