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Special Comment

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Default and Recovery Rates of Corporate Bond Issuers: 2000

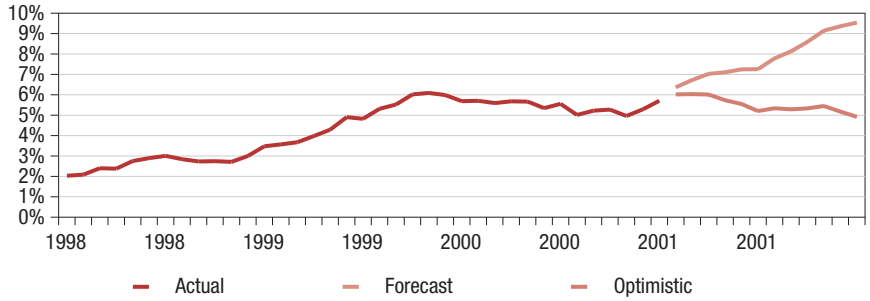
Summary

Corporate bond defaults surged in 2000, and are forecast to continue through 2001. This report documents the 2000 default experience, explores its underlying causes, and discusses Moody's forecast for defaults for 2001. Briefly, Moody's finds that:

- Worldwide, 110 Moody's-rated issuers defaulted on USD33.4 billion of long-term, publicly held corporate and sovereign debt in 2000. Including non-rated defaulters, 167 issuers defaulted on USD49.1 billion.
- The US continues to be the largest single source of defaults, contributing 125 defaults on $29.1 billion of publicly held long-term corporate bonds in 2000.
- Defaults in the telecommunications sector totaled USD6.48 billion, making it the top defaulting industrial sector by dollar volume. The Construction, Building & Real Estate, and Automobile sectors also experienced a disproportionately high volume of defaults in 2000.
- Moody's issuer-weighted trailing 12-month spec-grade default rate ended 2000 at 5.71% (revised), up from 5.69%. On a dollar-weighted basis, the spec-grade default rate finished 2000 at 6.21%.
- The 2000 all-corporate trailing 12-month default rate finished the year at 2.28%. Four issuers held investment grade ratings within one year of default, the highest number since 1989.
- Average recovery rates fell again for almost all seniority/security classes in 2000. Overall, recovery rates for corporate bonds averaged 28.8% of par, down from 39.7% last year, and below their post-1970 average of 42%.
- Moody's forecasts the speculative grade default rate to rise to 9.5% by the end of 2001, as negative credit trends persist and as an economic slowdown in the US could now meaningfully affect corporate failures.

This report introduces an enhancement to the algorithm used to estimate senior unsecured ratings for obligors that do not have Moody's-rated senior unsecured debt. Moody's incorporates this upgrade in order to increase the accuracy and quality of our research. The default and rating migration statistics reported here reflect this upgrade and are therefore revised from Moody's previous default studies.

Speculative Grade Model-Generated Forecast Vs Optimistic Scenario



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Foreword

Corporate bond defaults gripped the attention of investors and the media in 2000. With default rates forecast to increase through 2001 and concerns of a recession in the US mounting, this report, Moody's 14th annual corporate bond default study, is timely.

This report introduces some changes to Moody's annual default study. While the scope of the report continues to reflect the 80-year period for which Moody's has tracked defaults and rating changes, the focus now centers much more on the current year and recent events. The change in the title of the report (which omits the word 'historical') reflects this change in focus. Some sections of the report are still dedicated to reporting historical defaults and the performance of Moody's ratings, but our analytical toolbox now includes Moody's quantitative credit risk models, such as RiskCalc™. More attention has been directed to providing detail on the recent default experience. The *Analysis and Forecast* section and the appendix detailing industry default trends are part of that effort.

Moody's has also dedicated more space to describing the methodologies behind its default research, including its default rate forecasting model. Moody's does this with two purposes in mind. Firstly, Moody's strives to make its methodology as transparent as possible to investors. Secondly, there has been some misunderstanding among investors about Moody's default research methodologies. Moody's hopes to clear up any confusion that exists by describing our methodologies in detail, thereby making our statistics of better use to investors.

Most importantly, Moody's altered the algorithm that assigns the estimated senior unsecured ratings to issuers of long-term, public corporate debt. This algorithm is used to isolate the probability of default component of Moody's ratings and is described in great detail in *The Meaning of Moody's Ratings and Implied Senior Ratings* section. Briefly, the algorithm was modified to include two new types of ratings that were introduced in 1998 and 1999: Issuer ratings and Implied Senior ratings. The effect of including these new ratings has the effect of changing some historical default rates and rating migration rates. These statistics are reported in the appendix.

As an additional service, Moody's is making the data underlying many the charts and tables in this report available on-line. The defaulted company blurbs that used to appear in print in the appendix of the default study are now available separately as a downloadable file. These data can be accessed at www.MoodysRMS.com in the Research & Publications section.

2000 Default and Bond Market Highlights

Defaults by Geographical Region

The number and dollar total of defaulting corporate and sovereign bond issuers continued at a rapid pace in 2000, surpassing 1999's totals and setting an all-time record for the 80-year period for which Moody's has been tracking defaults. One hundred sixty-seven issuers defaulted on a total of over USD49.1 billion of long-term public debt in 2000, a 12% increase in the number of issuers over 1999 and an 8% increase in total dollar volume.

Default rates went in several directions in 2000, depending on the geographic region one considers. The global all corporate default rate, which includes investment grade and sub-investment grade issuers, edged up to 2.28% from 2.23% in 2000. The increase in the all corporate default rate reflects, in part, an increase in the number of defaults that were once investment grade (see the *Analysis and Forecast* section below for more detail on these "fallen angel" defaults).

The global speculative grade default rate was 5.71% (revised, previously 6.02%) in 2000, virtually unchanged from 1999's 5.69% (revised). As later sections discuss, the global speculative grade default rate took investors on a roller-coaster ride in 2000, as monthly default counts gyrated and the size of the speculative grade universe began to contract.

Default rates in the United States increased for both all corporate and sub-investment grade issuers. The US-only all corporate default rate rose from 2.73% to 3.26%, while the US-only speculative grade default rate climbed almost a full percentage point, from 5.83% to 6.82%.[1]

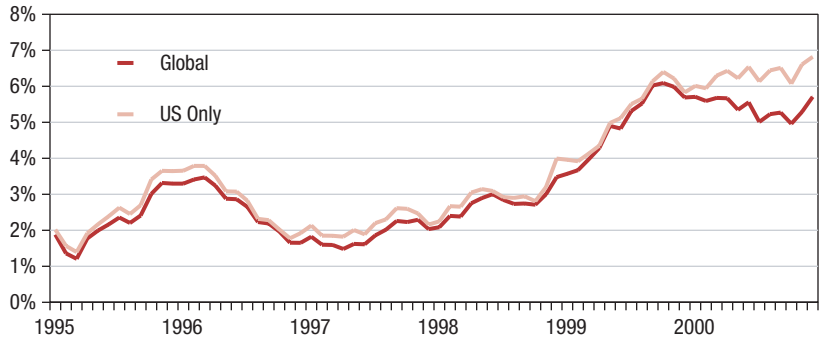
[1] *US-only default rates for speculative grade and all corporate issuers are reported monthly at www.MoodysQRA.com/research*

Unlike 1997 and 1998, in which sector-specific problems and economic stresses in Asia and emerging markets led to a high concentration of defaults in particular pockets, the surge in defaults in 2000 is characterized by a broad cross section of US-domiciled debt issuers. Of the 167 rated and non-rated defaults in 2000, 125, or 75%, of defaulting corporate debt issuers were based in the US. In dollar terms, the USD29.1 billion of defaulting debt belonging to US-based issuers represented 59.3% of all defaults. The distribution is skewed more highly for Moody's-rated issuers: 93 out of 110 rated issuers defaulted in the US, representing 84.5% of total defaulters.

Exhibit 1 shows the US-only speculative grade default rate versus the global speculative grade default rate. The two series track each other very closely over much of the five year period in the graph. In 2000, however, the two series noticeably diverge, with the US-only rate continuing to increase while the global rate remained virtually unchanged.

Exhibit 1 -Speculative Grade Trailing 12-Month Default Rates

US, Global Default Rates Parted Company in 2000



On a fundamental level, as the financial crises that fueled defaults in non-US markets in the 1997-1998 period finally tapered off, defaults in the US began to pick up. In the US, however, the macroeconomy had little to no effect on defaults in 2000. As we will see in the next section, deteriorating credit has driven US defaults.

For corporate issuers outside the US, 2000 marked a material decline in default rates. The non-US all corporate default rate fell to 0.84% from 1.46% in 2000; the non-US speculative grade default rate fell to 2.90% from 5.33%.

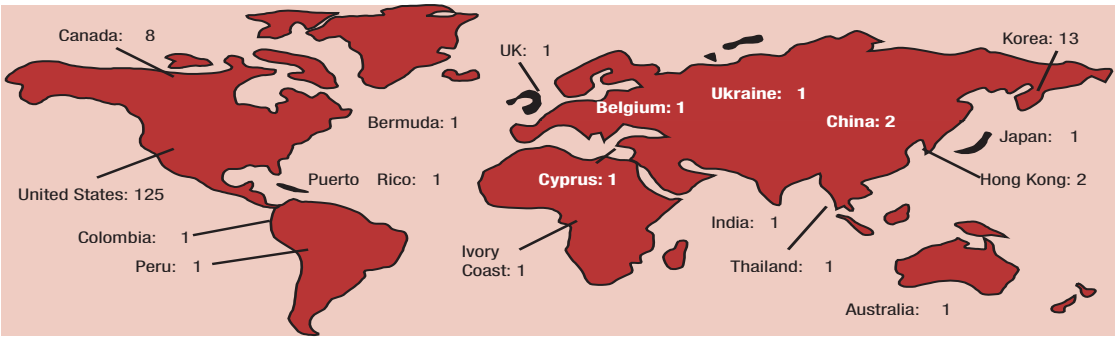
Exhibit 2 shows the geographic distribution of all defaulting issuers. As the map shows, defaults outside the US tended to be dispersed around the globe in 2000. Korea ran second to the US in the number of defaults with 13, totaling USD6.2 billion. None of these defaulters — which include Daewoo Motor Company (USD2.5 billion), Hyundai Engineering and Construction (USD2 billion), and Samsung Commercial Vehicle Company (USD261 million) — were rated by Moody's at the time of default, however.

Canada registered eight defaults totaling USD2.8 billion, 6 of which were rated. The default by Laidlaw, Inc. on over USD2.0 billion contributed the bulk of that total and was the largest rated single-issuer default globally in 2000. As a result, the default rate for Canadian speculative grade issuers rose to 7.52% in 2000, up from 4.62% in 1999 and 1.74% in 1998.

Defaults in 2000 also included three sovereign issuers: Ukraine, Ivory Coast, and the Republic of Peru. While this number seems low, it represents a tripling in the number of defaulting sovereign issuers from 1999, in which the Republic of Ecuador defaulted on USD6.6 billion of Brady Bonds. Together, these issuers account for USD8.2 billion of the default total, and comprising the bulk of defaults in 2000.

Exhibit 2 - Geographic Distribution of Defaultng Obligors

US Defaulters 85% of Global Total



Industrial Composition of Defaults

The telecommunications sector contributed the largest proportion of corporate defaulters, comprising 13.3% of the total dollar volume of defaults and an increase of 88.8% over 1999. The default of ICG Services together with ICG Holdings totaled over USD2.2 billion and were the largest US defaults. Two other large defaults in the sector helped put telecom defaulters at the top of the list: Paging Network Inc. (USD1.8 billion) and CellNet Data Systems, Inc. (USD899 million), also both US-based issuers.

Exhibit 3 breaks out the default totals by specific industry sector. The table shows the dollar volume of defaults, the proportion of dollar volume to the total, the percent change from 1999, and the total number of defaulting issuers. The industrial complexion of defaulting issuers changed considerably from 1999. Last year, defaults were concentrated in a few industries and were driven largely by sector-specific problems and the aftershocks of the Asian financial crisis. Defaults in these industries such as energy, shipping, and metals/mining came down in 2000.

Some large defaults by a handful of issuers helped put certain industrial categories near the top of the list of sector defaults. Laidlaw, Inc. almost single-handedly put the consumer transportation sector into fifth place, bringing the sector to 5.9% of the total volume of defaulting debt. Hyundai Engineering & Construction Co. Ltd. and Owens Corning put the Construction, Building, & Real Estate sector in second place. The Leisure, Amusement, & Entertainment sector was dominated by the cinemas: Carmike Cinemas, Inc., United Artists Theatre Company, Silver Cinemas International, Inc., and Regal Cinemas, Inc.

Exhibit 3 - Corporate Defaults by Specific Industry (Ex-Sovereign)

Industry	USD Billions	% of Total	% Change	Issuer Count
Telecommunications	$6.48	13.3%	88.8%	13
Construction, Building, & Real Estate	$5.01	10.3%	344.5%	8
Automobile	$3.35	6.9%	67.8%	7
Beverage, Food, & Tobacco	$3.07	5.8%	80.1%	12
Leisure, Amusement, & Entertainment	$2.93	6.0%	-16.4%	11
Consumer Transportation	$2.90	5.9%	2338.7%	4
Healthcare, Education, & Childcare	$2.10	4.3%	-41.4%	13
Financial (Non-Bank)	$1.90	3.9%	-68.3%	5
Textiles, Leather, & Apparel	$1.71	3.5%	60.2%	11
Metals & Mining	$1.58	3.2%	-5.5%	8
Retail	$1.43	2.9%	28.7%	8
Electronics	$1.28	2.6%	29.1%	8
Chemicals, Plastics, & Rubber	$0.98	2.0%	382.7%	8
Banking	$0.96	2.0%	72.5%	7
Forest Products & Paper	$0.86	1.8%	117.8%	6
Miscellaneous	$0.83	1.7%	-30.0%	6
Printing, Publishing, & Broadcasting	$0.79	1.6%	-37.5%	6
Cargo Transportation & Shipping	$0.52	1.1%	-66.3%	5
Machinery	$0.49	1.0%	2.7%	3
Non-durable Consumer Products	$0.36	0.7%	-51.0%	3
Aerospace & Defense	$0.23	0.5%	NA	2
Hotels, Casinos, & Gaming	$0.21	0.4%	-61.2%	3
Miscellaneous Manufacturing	$0.21	0.4%	37.2%	3
Diversified/Conglomerate	$0.20	0.4%	NA	1
Energy	$0.15	0.3%	-96.7%	1
Insurance	$0.15	0.3%	NA	1
Containers, Packaging, & Glass	$0.11	0.2%	NA	1
TOTALS	**$40.80**	**100.0%**	**—**	**164**

The appendix contains a detailed discussion of default activity for each of Moody's twelve major industrial sectors. It also contains one-year default rates and one-year default rate correlations for those twelve sectors. Using Moody's Risk Management Services' RiskCalc model for public firms, we also provide one-year default rate forecasts for select broad industries.

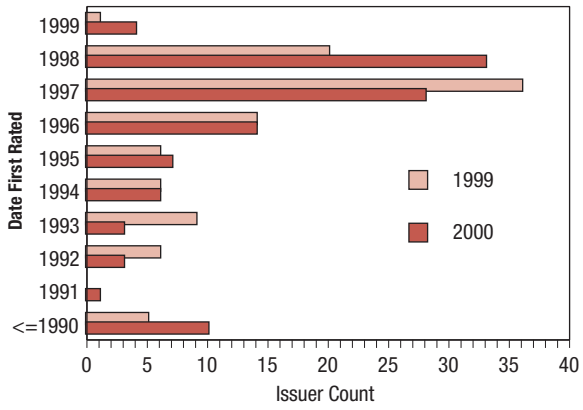
1997-1998 Debt Issuers Continue to Lead Defaults

In its 1999 annual default study, Moody's observed that issuers that defaulted in 1999 had rating histories considerably shorter than the historical average.[2] The seasoning effect, or hazard rate of default (default likelihood as a function of time in the market), historically reaches a maximum at about 3-1/2 to four years after first issuing debt. Moody's noted that the new issue cohorts that came to market in 1997-1998 proved to be considerably more risky in terms of their hazard likelihood of default: 50% of the defaulters had rated debt outstanding for less than three years.

Some Street pundits asserted at the start of 2000 that the larger than proportional amount of defaults from these cohorts constituted a one-time event that led to temporarily above-trend default rates, that going forward would no longer pose a high risk. Moody's maintained that the brief lull in defaults at the beginning of the year represented only a temporary aberration, and that it would not take long for this cohort to again start defaulting. This prediction proved to be prescient. Of the 110 rated defaulted corporate debt issuers in 2000, 60, or 55%, were first rated in 1997 or 1998 (see Exhibit 4). Four obligors defaulted just over one year after being rated (Supermarkets General Holding Corp., Safety-Kleen Corporation, ICG Holdings and ICG Services).

Exhibit 4 - Distribution of Rated Defaulters by First Rating Date

Over Half of 2000 Defaults from 1997-1998 Cohort



Defaulted Debt Recovery Values

Recovery values for defaulted long-term public debt obligations fell markedly from 1999 levels for almost every debt class in the capital structure. For all seniority/security classes, recovery rates are currently substantially below historical averages.

Senior secured bank loan prices fell 15% to USD62.20 per USD100 par; senior unsecured and subordinated bond issues plummeted, falling 20.7% and 26.2%, respectively, from their year-end 1999 values. As of January 2001, the average recovery rate for senior unsecured bonds was USD32.66, and for subordinated bonds USD22.43.

Senior secured bonds were the only class that showed some price appreciation over the last year, rising 6.6% to USD58.60.

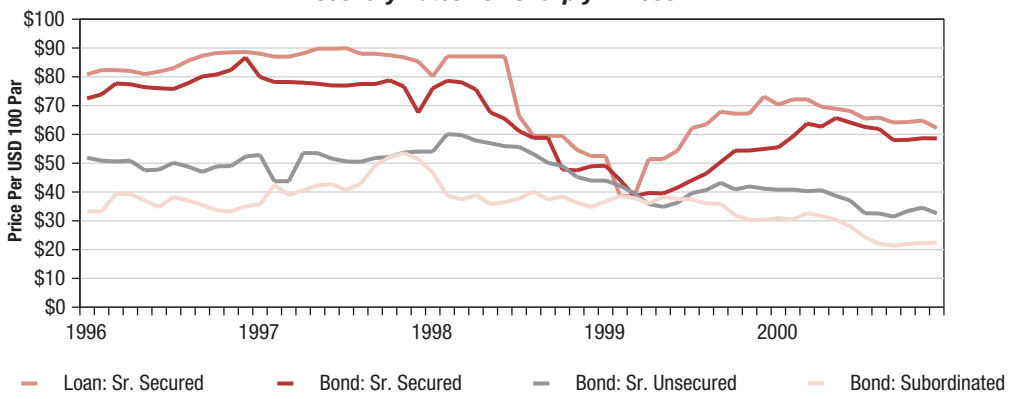
Exhibit 5 shows the twelve-month trailing average recovery rate for each priority of claim. For the 1996-mid-1998 period, recovery rates were generally above average. This period was characterized by a benign credit environment and historically low default rates. Following the Asian financial crisis and Russian default, recovery rates at all levels not only dropped precipitously, but also converged. By the beginning of 1999, senior and secured bank loans and bonds were effectively trading at subordinated bond price levels.

[2] *Moody's began measuring the hazard rate of default in "Historical Default Rates of Corporate Bond Issuers: 1920-1998," A Moody's Special Comment, January 1999.*

In the *Default Severity and Recovery Rates in Default* section, we document the historical recovery experience across seniority/security classes, as well as by Moody's rating, in more detail.

Exhibit 5 - Defaulted Bond Recovery Values by Seniority/Security

Recovery Rates Fell Sharply in 2000



Fallen Angel Defaults Increase

Defaults by obligors that held investment grade ratings one year before defaulting are rare events. Moody's rating methodology usually foresees credit problems, and orderly downgrades of these obligors to sub-investment grade status usually precede the default. However, event risk, rapid deterioration in a particular sector, or random, severe economic downturns occasionally leads to rapid rating downgrades from investment grade and to default. The market terms these credits "fallen angel" defaults.

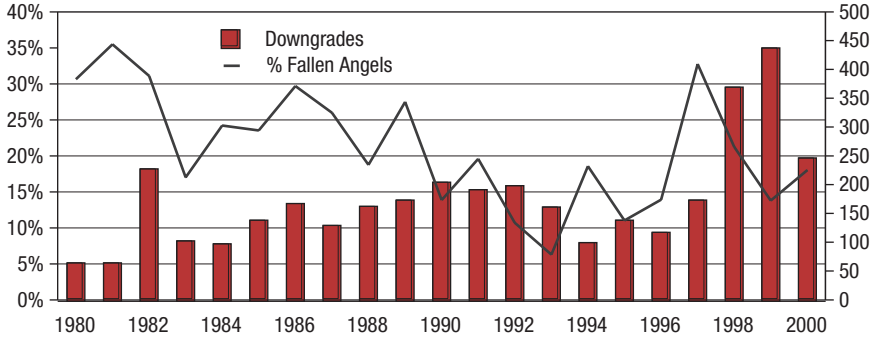
In 2000, four issuers that held investment grade ratings at the start of the year defaulted. These issuers were Owens Corning, Armstrong World Holdings, Laidlaw Inc. and affiliate Laidlaw One. In 1999 only one obligor defaulted that began the year above speculative grade (Harnischfeger Industries). Historically, four one-year fallen angel defaults is a high number. Only in 1986 and 1989 were one-year fallen angel defaults as high.

Two of the four fallen angel defaults were attributable to event risk. Both the Owens Corning and Armstrong World Holdings defaults were strategic Chapter 11 filings as protection from asbestos-related litigation.

The share of non-defaulting fallen angels as a percentage of all downgraded issuers actually decreased in 2000. Exhibit 6 shows that fallen angels have represented an increasing proportion of rating downgrades over most of the 1990s. After peaking at 32.7% of downgrades in 1997, the percentage of non-defaulting fallen angels ended 2000 at 18.0%.

Exhibit 6 - Number of Annual Rating Downgrades & Proportion Fallen Angels

Fallen Angels Increasing Share of Rating Downgrades



Corporate Debt Issuance

Demand for new corporate debt continued to slow in 2000 as interest rates rose and spreads widened, and as the forecasted rise in defaults was fulfilled. While the size of the rated corporate bond universe grew in 2000, the pace of that growth, particularly for speculative grade-rated issuers, slowed significantly.

Exhibit 7 shows the total dollar volume of annual new long-term public corporate debt issuance broken out into investment and non-investment grade. In 2000 total corporate debt issuance was USD165.7 billion, a 31.9% decrease over 1999's pace of debt issuance. While investment grade issuance contracted little, down 12.6% at USD132.7 billion, speculative grade issuance totaled only a third of 1999's total volume. Sub-investment grade debt issuance totaled just USD33 billion in 2000, down 64% from USD91.7 billion in 1999.

While poor performance in the US high yield market helped keep investors' appetite for new sub-investment grade issuance down, the retrenchment in speculative grade debt issuance was experienced world-wide. Exhibit 8 presents the number of rated speculative grade issuers outstanding in the US versus the rest of the world. The sharply lower pace of speculative grade issuance caused the size of the sub-investment grade universe to contract in 2000. The effect was felt most acutely in the US. Outside the US, however, the magnitude of the retrenchment was not as intense.

Exhibits 7 and 8 both show a clear boom-bust cycle for public bond issuance. Indeed, if one were to overlay default rates over these charts, one would see that a increases in default rates are preceded by a surge in corporate debt issuance. This correlation is built in to Moody's default forecasting model (see appendix). In the *Analysis and Forecast section*, we discuss some of the fundamental factors that have affected debt issuance, and how it relates to the default outlook going forward.

Exhibit 7 - Dollar Volume of New Corporate Bond Debt

Corporate Bond Debt Issuance Sharply Down in 2000

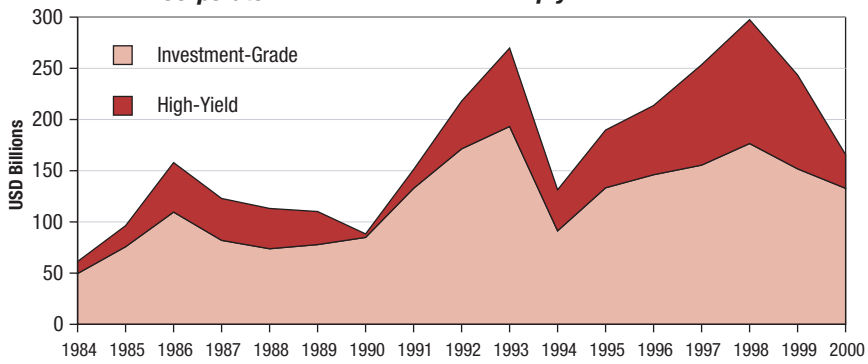
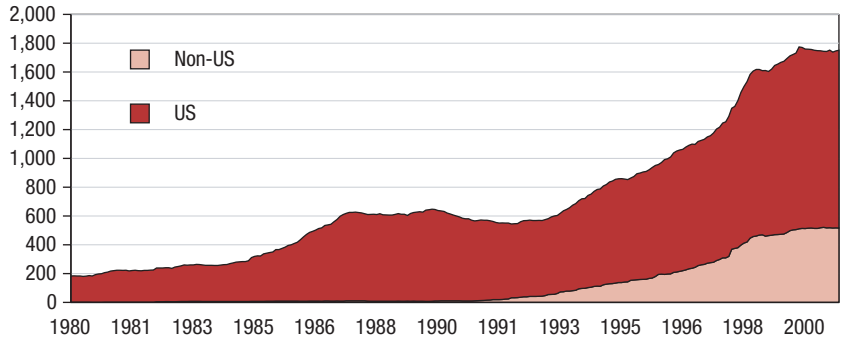


Exhibit 8 - Universe of US and Non-US Speculative Grade Issuers

Spec-Grade Retrenched Further in 2000



Analysis and Forecast

The rise in defaults over 1999 and 2000, particularly for US-domiciled obligors, caught most investors off guard, and led many investors to revise their previously optimistic outlooks on credit and defaults. Most now concede that the default rate will continue to rise over the next twelve months.

In this section, we present a comprehensive narrative for the rise in corporate defaults over the last four years. Here we draw together disparate explanations for the rise in defaults. Our motivation is not to develop a new quantitative model. Moody's already employs a statistical model to forecast the default rate. Our method will be both quantitative and qualitative. Using Moody's forecasting model, research and data, we posit a cogent theory and narrative to explain the recent rise in default rates and our outlook for defaults.

Explanatory variables for default rates fall along three dimensions: macroeconomic variables, market prices (e.g. interest rates), and indicators of credit risk. Each of these factors exerts an influence on default rates, though not necessarily at the same time or in the same magnitude.

To summarize our thesis up front, the rise in corporate bond issuance through 2000 is primarily the result of a speculative bubble in sub-investment grade issuance between 1996 and 1998, concentrated mostly in the US. The credit quality of the debt that came to market in that period was particularly poor. Although it is likely that many of these issuers might have eventually defaulted, exogenous, unexpected events in Asia and Russia immediately produced defaults, and more importantly, realigned investor risk preferences that accelerated the day of reckoning. Once the poor credit quality of speculative grade issuers was acknowledged, demand for high yield bonds slumped and access to capital for these credits tightened. At the same time, a reversal of the favorable economic environment in the US began.

Fueling Speculation: Awash in Liquidity

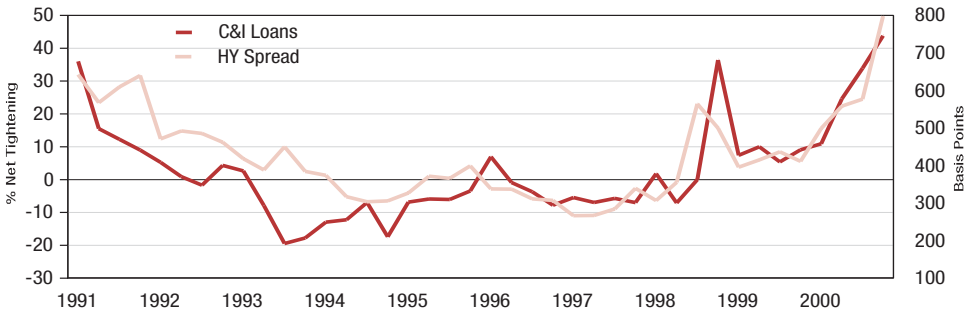
The surge in issuance of speculative grade debt giving rise to the current crop of defaults occurred in an economic environment that was awash in liquidity. The terms on which companies could finance their business plans, acquisitions, and to buy back equity shares were particularly easy in the mid-1990s. Exhibit 9 plots the speculative grade spread over Treasuries and the net percent of banks reporting tightening lending standards for C&I loans to large and medium-sized firms, as reported in the Federal Reserve's Senior Loan Officer Opinion Survey on Bank Lending Practices.

The chart shows that the spread over treasuries for speculative-grade rated issuers[3] fell dramatically following the high yield shake-out at the start of the decade and remained low until 1998. The spec-grade spread over Treasuries reached a decade low of 263 basis points in March 1997. Low interest rates also allowed for cheap refinancing, which had, until the 1997, a positive net impact on the credit profile of speculative grade issuers: the upgrade to downgrade ratio between 1994 and 1997 was 1.3. The default rate for speculative grade issuers also reached an 18-year low of 1.8% in 1997.

At the same time, bank lending standards came down. Indirectly, bank lending standards show the ease with which low-rated bond issuers could tap the capital markets. In a more direct way, the tolerance of banks for taking on risk translates into a lower ex-ante probability of default for the marginal borrower as long as that tolerance persists. Banks might, for example, choose to be more lenient about covenant violations that might precipitate a default.

Exhibit 9 - High Yield Spread & Net Bank Tightening on C&I Loans

Awash in Liquidity: Low Spreads, Loose Lending 1992-1998



[3] *Source: Moody's speculative grade index.*

Investors were also clamoring for places to put their cash. According to Investment Company Institute data, from 1996 to 1998 over USD50 billion flowed into high yield mutual funds. Such strong demand, combined with low yields, fostered conditions for high risk, high yielding issuers to enter the market.

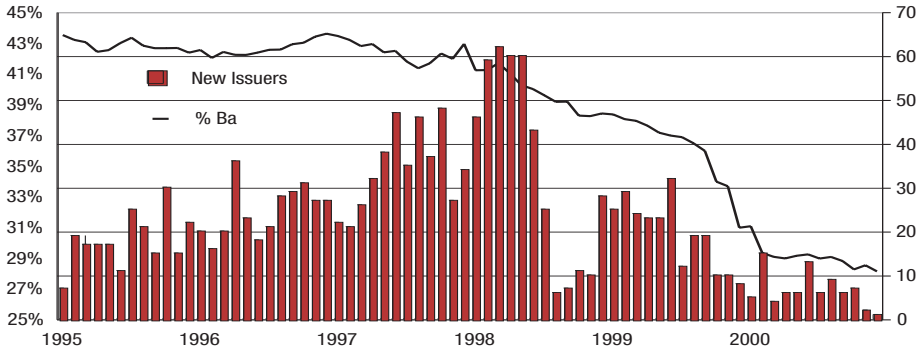
Sowing Default Seeds: Credit Quality Plummets

Starting in 1995 the monthly number of new issuers with speculative grade ratings entering the bond market increased rapidly. Between 1994 and 1996 the number of new issuers entering the bond market with sub-investment grade ratings averaged 19 per month. From 1997 to 1998, that average increased to 35 per month. In Exhibit 10, we see that the monthly number of spec-grade rated issuers exploded in 1995, reaching a peak of 62 issuers in April 1998.

A dramatic increase in bond issuance via the 144A market piled fuel on the fire. Rule 144A relaxes SEC registration requirements, allowing issuers to sell debt more quickly to qualified buyers. Rule 144A issuance accounted for about 70% of 1997 speculative grade issuance by US obligors. Over 80% of such new issuance was rated B1 or lower.[4]

Exhibit 10 - Monthly New Spec-Grade Issuer Counts & Percent Rated Ba

As Spec-Grade Issuance Increased, Credit Quality Plummeted



The surge in spec-grade debt issuance was accompanied by a drastic and protracted decline in credit quality, also shown in Exhibit 10. The percentage of new speculative grade issuers holding Ba ratings (Ba1, Ba2, Ba3), Moody's highest speculative grade rating, began a free fall in 1997. From 1980 to 1996, the average percentage of higher-quality spec-grade rated issuers is 53.8%. Even at the height of the worst credit collapse since the Great Depression, in 1991, the percentage of Ba-rated spec-grade issuers was 33.8%. As of January 1, 2001, that percentage stands at only 28.3%, its lowest level in the 80 years for which Moody's has data.

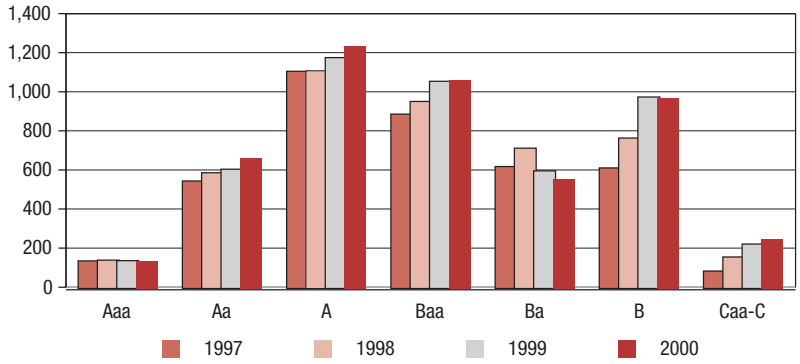
The overall deterioration in credit quality is reflected in the distribution of Moody's ratings. Exhibit 11 presents that distribution by broad Moody's rating for the 1997-2000 period. Here again we see the shift from Ba ratings to B ratings and below for corporate issuers. At the same time, negative credit migration caused the proportion of issuers holding Caa to C ratings increase.

Exhibit 37 in the appendix presents the one-year rating migration matrix for the cohort formed January 1, 2000. In addition to showing the trends discussed above, we also see from this matrix that Baa-rated issuers experienced a default rate in 2000 (0.38%) more than twice as high as the 1980-2000 average (0.16%).

[4] *See "Healthy Volumes, Unhealthy Pallor: US Speculative-Grade '98 Outlook and '97 Review," A Moody's Special Comment, February 1998.*

Exhibit 11 - Ratings Distribution, 1997-2000

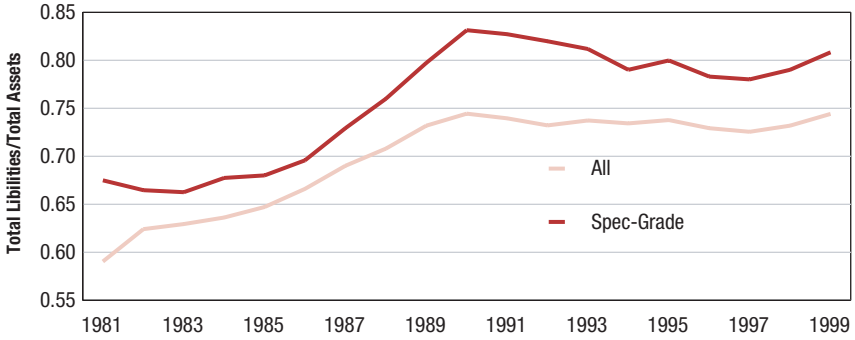
Distribution Continued to Shift to Lower Ratings in 2000



As we noted above, over much of the 1990s credit quality improved generally. One factor contributing to that improvement was a gradual decline in leverage, especially for non-investment grade obligors. Exhibit 12 presents one measure of leverage, total liabilities to total assets, for Moody's-rated issuers (non-financial firms) and how it has evolved over the history of the modern high yield market. Following the default debacle at the beginning of the decade, companies began to de-lever. In 1997 that trend reversed. For all corporate issuers, leverage has returned to early-1990s levels (about 0.74). Speculative grade issuers have also showed a willingness to pile on debt, though not in as high a proportion as in 1990-1991.

Exhibit 12 - Total Liabilities/Total Assets for Moody's Rated Issuers

After Falling Over 1990s, Leverage Began Upswing in 1997



A large portion of the proceeds from speculative grade issuance in 2000 has been dedicated to mergers and acquisitions (35.9%), and capital expenditures (22.6)%.[5] When one examines the credit impact of heightened leverage and the purposes of the proceeds, a distinction begins to emerge between investment grade issuers and non-investment grade issuers.

For investment grade issuers, rating downgrades that are the result of M&A transactions have increased over the 1990s, but particularly so since 1996. In contrast, the proportion of ratings downgrades for non-investment grade issuers has grown more slowly, and actually declined somewhat in the 1996-2000 period, shown in Exhibit 13.

Referring back to Exhibit 6, the rise in M&A financing and leverage coincides with the rise in fallen angel downgrades. Unlike the leveraging of the 1980s, however, the present use of proceeds from spec-grade debt issuance is predominantly to fund business plans and capital expenditures rather than leveraged buy-outs.[6]

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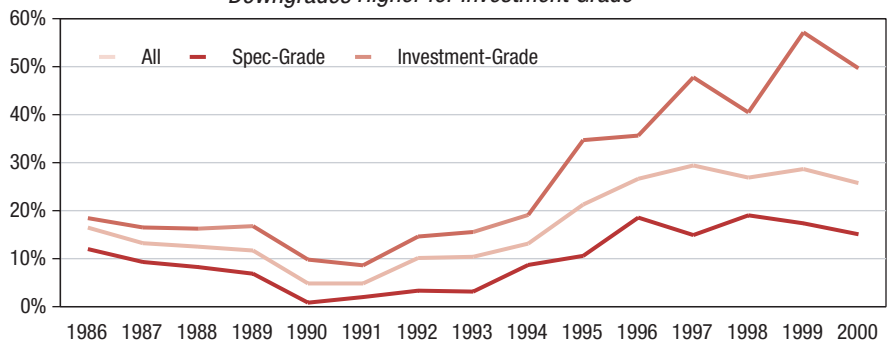
[5] *Source: "Correlations and New Issuance," Merrill Lynch High Yield Research, January 2001.*

[6] *Just 6.5% of high yield proceeds were dedicated to LBOs in 2000, compared with 32.7% in 1989. Source: Merrill Lynch High Yield Research.*

Exhibit 13 - Proportion of Rating Downgrades Resulting from M&A

Downgrades Higher for Investment Grade



From Euphoria to Collapse

The spike in speculative grade debt issuance was quickly followed by a collapse from which the market would not recover. This occurred within the span of just about two years. Up to this point we have discussed some of the fundamental reasons for the rise in speculative grade issuance that would set the stage for increases in the default rate. We have not, however, shown that the rise in defaults is largely the result of a speculative bubble. To get from the fundamental explanations to the speculation hypothesis, we need to show that there was a sense of euphoria in the market that suddenly, quickly, and ultimately irreversibly gave way to collapse.

This is not an easy task, since quantitative measures of euphoria are hard to come by. Sometimes the evidence is anecdotal, but clear with hindsight. It was in 1997 that Alan Greenspan warned investors of "irrational exuberance" in equity markets. Economic growth was very strong and had seemingly unbounded potential, and the outlook among analysts for start-up companies was overwhelmingly bullish. In the media, there was talk of the end of the business cycle as we knew it. The days of double-digit default rates were regarded by some as just a chapter in financial history.

It is important to note that one does not need to make any assumptions on investor rationality (or irrationality) to argue the speculation theory. The key element is that some event(s) precipitated a sudden and drastic change in investor risk preferences and their outlook on credit. Such actions in light of new information are completely consistent with the assumption that investors have rational expectations.

In the present case, the precipitating events were the Asian financial crisis of 1997 and the Russian debt default in 1998. The former event produced a wave of defaults of issuers in Asian and emerging markets that had an immediate impact on the default rate. In 1997 the non-US speculative grade default rate was 1.57%; by 1999 that rate more than tripled to 5.38%.

At the time, high yield investors deemed that the rise on the global spec-grade default rate was isolated to these non-US obligors and to issuers in industries that had exposure to emerging markets (e.g. shipping). Investors also attributed defaults to industry sectors that were hit hard by falling commodity prices in 1998 (e.g. energy). But these defaults nevertheless began to have an impact on the broader US high yield market. The spec-grade spread over Treasuries bottomed in 1997 (see Exhibit 8), and banks became more cautious with their lending. But, as Exhibit 10 shows, the financial turmoil in Asia had only a temporary impact on speculative grade issuance.

Then in August of 1998 the Russian Federation defaulted on USD9.7 billion of debt. Spreads on sub-investment grade debt blew out immediately. Between August and October 1998, the spec-grade spread widened 240 basis points. The impact on new speculative grade issuance was more potent. Between August 1998 and February 1999 a total of only 24 new issuers rated speculative grade entered the market, a fraction of the 60 issuers that entered the market just a couple of months before.

Although speculative grade issuance temporarily rebounded through the summer of 1999, the rally did not have legs. Spreads continued to widen and credit quality became a growing concern as the default rate began to rise for US-domiciled issuers. From 1997 to 1998 the default rate for US-based speculative grade-rated issuers rose from 2.16% to 6.22%. Access to capital for very risky borrowers was effectively shut down.

The rise in defaults to date, and indeed going forward, represents the slide down the cyclical low in the credit cycle, which in Moody's opinion has yet to reach bottom. The excessively poor credit quality of the issuers that entered the debt markets in the late 1990s will take some time to wash out. On top of the existing poor credit foundation are fears that the broader economy will impact default rates. If the economy were to stumble, we expect to default rates to rise over and above the rates that have been the result of speculation alone. We now turn our attention to these macroeconomic factors.

Macroeconomic Factors

There would seem to be a direct, intuitive link between aggregate economic activity and default rates. When the economy is in an expansion, corporate earnings and profitability are on the rise, so it seems logical that the default rate should go down. Conversely, during an economic contraction, slack demand may result in lower operating margins and cash flow, prompting an increase in the default rate. The direction of causation is assumed to flow from measures of economic growth, such as GDP or industrial production (IP), to default rates.

In the case of the emerging market defaults in 1997, the direction of causation seems pretty clear-cut: the dramatic slowdown (or persistent sluggishness) and freezing up of debt capital markets resulted directly in a high number of corporate defaults.

Moody's research has found, however, that the relationship between the macroeconomic variables and default rates is more complex than the simple, intuitive explanation suggests. Between 1920 and 1999 the correlation between IP and Moody's all corporate default rate conforms to the intuition above: -0.14. From 1920 to 1965, significant increases in the default rate were typically preceded by weakness in the economy (as represented by IP). Since 1965 it has been more often the case that increases in the default rate occur *in advance* of a weakening in industrial production. This shift in the lead-lag relationship demonstrates that the statistical relationship between default rates and macroeconomic variables is tenuous.

Moody's default forecasting model includes changes in real (inflation adjusted) US Industrial Production (IP) to measure the effect of fluctuations in the macroeconomy. The IP variable actually adds very little to the forecasting power of Moody's default forecast model, and is in fact only barely statistically significant.[7]

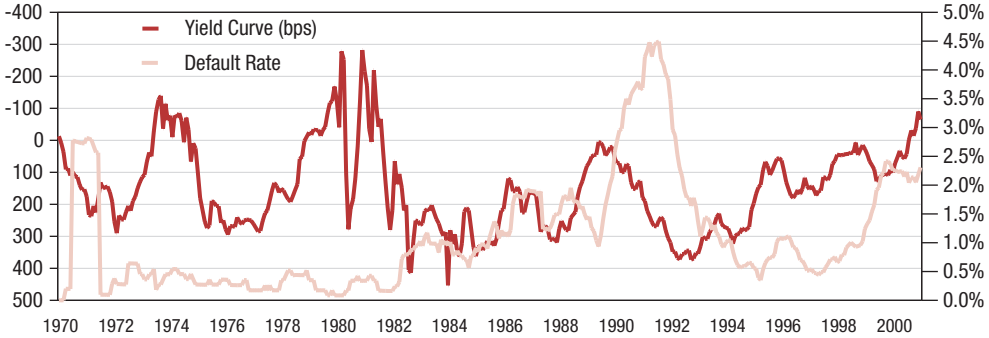
Fears that a catastrophic increase in defaults would cause the broader economy to falter (the reverse of the above reasoning) fail to recognize the distinction between correlation and causality. A rise in the default rate can precede an economic downturn in time, but not be the cause of it. The possibility exists that stirrings of problems in the macroeconomy affect the most highly levered, cash dependent firms first before manifesting themselves in macroeconomic variables such as GDP or IP. This explanation also has intuitive appeal: credit problems tend to roll up the economic food chain rather than roll down. The answer to this question is ultimately empirical and lies beyond the scope of this report.

The recent surprise 50-basis point cut in The Fed's federal funds target rate has revived hope in the high yield market. While this action may represent a turning point for high yield total returns, investors should not place too much hope that the rate cut, or even subsequent rate cuts, will have a near-term effect on default rates. The shape of the treasury yield curve (ten-year bond yield less the 90-day T-bill yield) is one of the variables in Moody's default rate forecasting model. Research shows that changes in the slope of the Treasury yield curve have an inverse effect on the default rate, but the effect shows up with a lag, as shown in Exhibit 14. The optimal lag is, in fact 17 months. So a steepening of the yield curve will, if it persists, help reduce the default rate eventually, but the credit problems that exist will overwhelm any effect from interest rate cuts.

[7] *t=2.807 for the speculative grade model. See "Predicting Default Rates: A Forecasting Model for Moody's Issuer-Based Default Rate," A Moody's Special Comment, August 1999, for full specification of the model.*

Exhibit 14 - All Corporate Default Rate Vs Treasury Yield Curve

Time Lag Between Correlation of Yield Curve and Default Rates



2001 Default Rate Forecast

Moody's default forecasting model provides predictions of the global default rate for all corporate issuers and for the speculative grade subset of issuers. From its current 2.28% level, the default rate for all rated corporate bond issuers is forecast to reach 3.5% by the end of 2001.

The global speculative grade default rate is forecast to increase from its current level of 5.71% to 9.54% by the end of 2001. Implicit in the forecast is a monthly default count of 14 defaulters per month, on average, for the next twelve months. At the time we write this report, sixteen rated defaults have already occurred in January 2001.

While we believe that defaults will continue to build through 2001, it is instructive to consider an alternative, optimistic scenario. The graph on the cover of this report charts the actual speculative grade default rate, the model-generated forecasted rate, and an 'optimistic' case. The optimistic scenario assumes that there will be only seven defaults per month for the rest of the year (half the model-generated forecasted monthly default counts). The optimistic case uses the same forecasted denominators as the model-generated case, but the numerator is not the product of our model. It is simply the sum of our assumption of seven defaults per month.

The contrast between the optimistic case and our forecast is striking. With only seven defaults per month on average, the spec-grade default rate would end 2001 down at about 5%. That the default rate would not fall further highlights the fact that over the next twelve months the denominator of the default rate, the number of speculative grade rated issuers, will contract by about 7%.

Although Moody's does not yet have a model to forecast US-only default rates, the default rate for US-based corporate bond issuers will be higher than the global forecasted rate. The US spec-grade default rate has run about 1% higher than the global rate over 2000. By the end of 2001, the US spec-grade default rate will likely near 11%, as the flow of defaults continues to be dominated by US-domiciled obligors and the size of the US speculative grade-rated issuer pool continues to contract.

The default rate forecast for corporate bond issuers is corroborated by broader measures of default risk. Moody's Risk Management Services' RiskCalc™ model assigns a one-year Default Probability (DP) to firms with publicly traded equity.[8] The universe scored using RiskCalc is therefore a much larger and diverse set of companies than the Moody's-rated universe, scoring some 9,000 companies. What we find is that for this large group of firms, average default risk has increased.

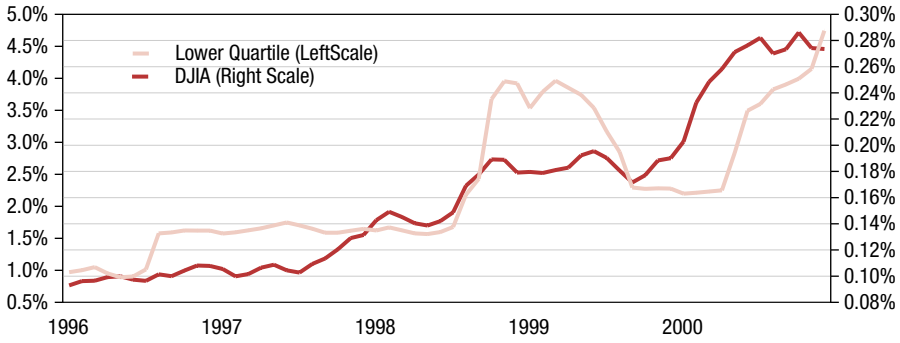
Aggregating these one-year DPs, we can look at the likelihood of default for the entire scored universe or specific subset of that universe. In Exhibit 15 we took the average DP for 27 of the 30 companies in the Dow Jones Industrial Average (DJIA) and the average DP for the lowest quartile of the entire RiskCalc™universe. The graph shows that for these two very different sets of companies, the average one-year probability of default has increased in 2000. The companies in the DJIA, which are large, liquid, blue chip companies, have shown a marked increase in default risk. While nominally low (0.28% probability of

[8] *See "Moody's Public Firm Risk Model: A Hybrid Approach to Modeling Short Term Default Risk," A Moody's Special Comment, March 2000, for detail on the model's construction. Available at www.MoodysRMS.com*

default), the DP has increased by about 10 basis points in 2000. The probability of default for DJIA companies has more than doubled from 1997.

The lowest quartile of the entire RiskCalc universe (roughly speculative grade) shows significantly higher default risk. The index shows a 4.74% average risk of default one year hence, roughly equivalent to a B1 to B2 rating on Moody's scale. The DP for this segment doubled over 2000.

Exhibit 15 - Moody's RiskCalc One-Year Default Probability Indices



We have already documented the continued deteriorating credit picture thoroughly in this study. The risk of weak credit fundamentals is compounded by the sheer volume of debt that will have to be refinanced in 2001 and beyond. Some USD28.0 billion of bank loans and bonds will have to be refinanced in 2001. While demand for speculative grade issues has recently improved somewhat, refinancing for the lowest rated spec-grade issuers, which as we have seen have increased, will still be a challenge, especially for the lowest-rated issuers. Approximately USD1.4 billion of bonds, or approximately 25% of all maturing high yield bonds, rated Caa will need to be refinanced in 2001.[9]

In the section above we highlighted the fact that macroeconomic factors have not significantly impacted default rates for US corporate debt issuers. However, a sustained slowdown in economic growth in the US would eventually increase defaults. Our forecast makes no assumptions about a 'hard' or 'soft' landing for the US economy. If industrial production slows significantly it will proportionally impact our forecasted default rates.

Due to the limited number of defaults in any given industry, Moody's default rate forecasting model does not break out expected default rates by industry sector. In the industry sector appendix we do provide an index of the one-year Default Probabilities (DP) for some sectors using Moody's Risk Management Services' RiskCalc™ model for public firms. Default risk, as measured by the DP, for all companies with public equity has increased on average. Industries such as retail and communications (which includes telecommunications) show default risk increasing above average. Manufacturing and transportation show increases in the average DP, but on par with the overall rise in average default risk. Despite recent turmoil in the utilities sector, the average DP for utilities actually decreased in 2000, suggesting subsiding default risk in 2001. Default rate trends and RiskCalc™ forecasts are included in the appendix.

Data and Methodology

The Moody's-Rated Universe

Moody's bases the results of this study on a proprietary database of ratings and defaults for industrial and transportation companies, utilities, financial institutions, and sovereigns that have issued long-term debt to the public. Municipal debt issuers, structured finance transactions, private placements, and issuers with only short-term debt ratings are excluded. In total, the data cover the credit experiences of over 16,000 corporate and sovereign issuers that sold long-term debt publicly at some time between 1919 and the start of 2000. As of January 1, 2001, over 4,900 of those issuers held Moody's ratings. These issuers account for

[9] *"Refunding Risk for Speculative Grade Borrowers, 2001-2003," A Moody's Special Comment, December 2000.*

the bulk of the outstanding dollar amount of U.S. public long-term corporate debt and a substantial part of public issuance abroad.

Moody's default database covers over 3,350 long-term bond defaults by issuers both rated and non-rated by Moody's. We compiled these default histories from a variety of sources, including our own Industrial, Railroad, and Public Utilities Manuals; reports of the National Quotation Service; various issues of The Commercial and Financial Chronicle; our library of financial reports; press releases; press clippings; internal memoranda; and records of analyst contact with rated issuers. We also examined documents from the Securities and Exchange Commission, The Dun & Bradstreet Corp., the New York Stock Exchange, and the American Stock Exchange.

Moody's Definition of Default

Moody's definition of default was designed to rigorously assess the performance of its ratings as predictors of default. Consequently, Moody's definition is strict, and includes three types of default events:

a) There is a missed or delayed disbursement of interest and/or principal, including delayed payments made within a grace period;

b) An issuer files for bankruptcy (Chapter 11, or less frequently Chapter 7, in the US) or legal receivership occurs; or

c) A distressed exchange occurs where: (i) the issuer offers bondholders a new security or package of securities that amount to a diminished financial obligation (such as preferred or common stock, or debt with a lower coupon or par amount), or (ii) the exchange had the apparent purpose of helping the borrower avoid default.

The central purpose of this definition is to capture events that change the relationship between the bondholder and bond issuer from the relationship which was contained in the original agreement, and which subjects the bondholder to an economic loss. We seek to identify economic loss that is the result of a credit event. Importantly, economic losses suffered by bondholders due to changes in market conditions only are not considered defaults. Nor are losses due to price changes associated with a deterioration in the credit quality of the issuer, as long as the terms of the obligation are being met.

Category a) is objectively observable and easily related to the purpose of the definition, as stated above. When an obligor fails to make a payment on the scheduled payment date, bondholders suffer a monetary loss which is not due to a price change, but rather to a credit event. Although bondholders may be made whole at a later date, this is not known with certainty at the time of the missed payment, so that investors bear meaningful opportunity cost. Even if the indenture provides for a grace period, this merely allows the issuer to avoid legal proceedings if the payment is made up in time. It does not negate the loss suffered by investors. Moreover, because the obligor has failed to perform according to the original agreement, the fundamental relationship between bondholder and bond issuer has changed. Strict technical defaults, such as violations of covenants, while important, are not considered defaults by Moody's.

Category b) is similarly clear-cut. In countries in which there is a significant amount of public debt issuance, some type of legal bankruptcy code or process exists. In the US, we recognize both "straight" Chapter 11 filings and "pre-packaged" Chapter 11 filings, and Chapter 7 filings as bankruptcies. Outside the US, receivership, administration, or seizure by regulators are considered defaults under this category.

Category c) is the most subjective of the three classes of default and may apply in a wide variety of circumstances. A default which falls under the category of distressed exchange may be very subtly related to the particular details of the situation. By including distressed exchange as category of default, Moody's is not seeking to broaden the central idea of what constitutes a default. Rather, we are seeking both to include credit events that carry the same basic negative credit characteristics associated with non-payment and bankruptcy, but which have avoided these more extreme outcomes. One of the goals of including distressed exchanges in our default definition is simply to get the timing right. Many situations that ultimately result in non-payment or bankruptcy begin with distressed exchanges. In these cases, the distressed exchange can be thought of as the initial default event.[10]

[10] *See " Moody's Approach to Evaluating Distressed Exchanges," June 2000, for more detail on this class of defaults*

The Meaning of Moody's Ratings and Estimated Senior Ratings

Moody's rating process is designed to produce a consistent measure of relative credit risk, the primary consideration of which is Moody's evaluation of expected credit loss. Moody's evaluation of expected credit loss reflects both the probability of default and the severity of loss in the event of default expressed through a simple rating symbol on a uniform rating scale. Moody's ratings are designed to provide investors with a consistent indicator of credit quality with the full consideration of geographic, sectoral, structural, and contractual standing of the obligation.[11]

The expected loss associated with a particular bond is, mathematically, the likelihood of default multiplied by the severity of default. The second part of this equation, the severity of loss in the event of default, is a debt issue-level characteristic. The section on recovery rates in this report addresses this part of the equation.

While loss given default is understood as a bond-level characteristic, the first part of the expected loss equation, the probability, or in more forward-looking terms, the likelihood of default, is treated as an issuer-level characteristic. Moody's ratings are judgments that are intended to support investment decisions. To evaluate our ratings' performance as indicators of the probability of default, we should then use the judgment itself as the unit of study. Because the number of credit judgments that Moody's must make does not vary with either the par amount or number of bonds of the issuer, we consider the bond issuer itself as the unit of study. Separately tabulating additional issues by number or total par amount of a single issuer would bias the results toward the default characteristics of issuers with multiple or large debt issues.

In order to calculate historical default rates, which are estimates of the expected default probability component of ratings, we must, therefore, hold severity considerations constant. We do this by considering the rating on each company's senior unsecured debt or, if there is none, by statistically implying such a rating on the basis of rated subordinated or secured debt. In most cases, this will yield an assessment of risk that is relatively unaffected by special considerations of collateral or of position within the capital structure. The process that assigns these issuer-level ratings is called the senior ratings algorithm (SRA), the resulting ratings are called "estimated senior unsecured ratings" or, more concisely, "estimated senior ratings."

Modifications to the senior ratings algorithm are occasionally necessary. Moody's has, from time to time, refined its rating scale and introduced new types of ratings to help investors better gauge the credit risks of debt issuers. This year we have incorporated some improvements to the algorithm used to estimate senior unsecured ratings. In the process, some of the estimated senior rating histories have been revised, thereby generating some changes in previously reported default rates. The resulting figures represent a more accurate estimate of the risk of default associated with each Moody's rating.

Specifically, the senior ratings algorithm now includes in its notching matrix two new types of ratings to estimate an issuer's senior unsecured rating. In July 1998 Moody's introduced Issuer Ratings, and in May 1999 Senior Implied Ratings. Issuer Ratings express Moody's opinion of an entity's ability to meet its senior financial obligations.[12] Senior Implied ratings are used to rate issuers in leveraged finance, and reflects the entity's business and financial risk as if it had a consolidated corporate structure and a single class of debt.[13] Specific debt issues of leveraged obligors are rated through a process of notching from the Senior Implied rating that distributes expected loss severity across the entity's capital structure.

The practical implications of the new senior ratings algorithm are that default rate calculations, rating transitions, etc., will be different than reported in previous Moody's research. This is particularly true for default rates calculated by rating notch. The new senior ratings algorithm potentially reallocates existing issuers to a different rating bucket than under the old method. Note that it is not the number of defaults that has changed. The change in the senior ratings algorithm affects the size of the *denominator* (size of the universe under consideration, e.g. speculative grade) of the default rate, not the numerator.

If, for example, and issuer held a Baa3 rating under the old method, but now holds a Ba1 rating under the new method - which takes into account the obligor's Issuer and Senior Implied ratings - that issuer would now count in the denominator of the speculative grade default rate whereas it did not before. Ceteris paribus, this change *reduces* the default rate.

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[11] *See "The Evolving Meaning of Moody's Bond Ratings," A Moody's Special Comment, September 1999.*
[12] *See "Issuer Ratings Provide New Tool for Investors and Issuers," A Moody's Special Comment, October 1998.*
[13] *See " Moody's Analytical Framework for Speculative Grade Ratings," A Moody's Special Comment, May 1999.*

The global speculative grade default rate, for example, has been re-scaled to 5.71% under the new SRA from 6.02% under the old SRA, due to the effect of the algorithm assigning a higher number of issuers to the denominator, the size of the speculative grade universe, while the numerator is essentially unchanged. The statistical appendices at the end of this report detail the changes on default rates by rating notch.

Moody's Ratings as Indicators of Default Probability

Calculating Default Rates

Moody's default rates are fractions in which the numerator represents the number of issuers that defaulted in a particular time period and the denominator represents the number of issuers that could have defaulted in that time period. In this study, the numerators are the numbers of issuers defaulting on Moody's-rated debt. The denominators are the numbers of issuers that potentially could have defaulted on Moody's-rated debt, with an adjustment for issuers exiting the capital markets.

The trailing 12-month default rate for month t and rating universe k is calculated as,

$$D_{k,t} = \frac{\sum_{t-11}^{t} Y_{k,t}}{I_{k,t-11}} \qquad (1)$$

Where $D_{k,t}$ is the trailing 12-month default rate in month *t* for rating universe *k*. *k*, for example, could be all corporate issuers, US speculative grade issuers, or Ba-rated issuers in the telecommunications sector. The numerator is the sum of the number of defaulters, *Y*, in month *t*, that were in the rating universe *k* as of *t-11*. The denominator, $I_{k,t}$ is the number of issuers left in the rating universe *k* in month *t-11*.

It is important to note that defaulters that end up in the numerator of equation (1) must have been in the appropriate rating universe at the beginning of the measurement period. The one-year default rate for speculative grade issuers, for example, would only include obligors that held a speculative grade rating twelve months ago. Fallen angels, therefore, would have to remain speculative grade for at least a year before they counted in the speculative grade default rate.

The denominator in equation (1) is a slow moving value, which is known with near certainty 12-months in advance. The denominator is simply the number of rated issuers outstanding 12 months ago, adjusted to reflect the withdrawal from the market of some of those issuers.

The adjustment for withdrawals is important because the denominator is intended to represent the number of issuers who could potentially have defaulted in the subsequent 12-month period. The adjustment captures the natural attrition in the market from non-credit-related issuers exiting, and avoids overstating the number of issuers who could potentially default during the year.

Moody's does not withdraw ratings because of changes in the credit quality of issuers. In each month, some issuers may call or have all outstanding debt mature without issuing any new debt. Alternatively, mergers or acquisitions may result in one issuer assuming all of the debt of another issuer, while defeasance or debt conversion of debt to equity can also result in a withdrawal of the issuer's bond rating.[14]

These non-credit-related withdrawals may occur unevenly over any given 12-month period, but on average are approximately uniformly distributed through time. Our adjustment subtracts from the denominator the time-weighted average number of withdrawals during the previous 12 months. To make this adjustment, Moody's simply subtracts from the gross rated-issuer count 12 months ago, one-half of the issuers who withdrew from the bond market for non-credit related reasons during previous 12 months (in terms of equation (1), the period *t-11* to *t*).

We define default rates for any rating classification in a manner analogous to that used for calculating overall corporate default rates. For the B rating, for example, the one-year default rate is the number of Moody's-B-rated issuers that defaulted over the following one-year period divided by the number of

[14] *For a complete discussion of this adjustment and withdrawn ratings in general see "Moody's Rating Migration and Credit Quality Correlation," A Moody's Special Comment, July 1997.*

Moody's-B-rated issuers that could have defaulted over that period. The issuer-weighted average of default rates (defined as of the start of each year) represents an estimate of the risk of default within any one-year period. (The underlying one-year default rates for each rating category from 1970 through the present are included in Exhibit 28 of the appendix.)

Moody's employs a dynamic cohort approach to calculating multi-year default rates. A cohort consists of all issuers holding a given estimated senior rating at the start of a given year. These issuers are then followed through time, keeping track of when they default or leave the rated universe for non credit-related reasons (e.g., maturing of debt). Thus, the cohorts are dynamic and allow the estimation of cumulative default risk over multi-year horizons. This allows for the comparison and averaging of default rates over different periods. Also, by forming and tracking cohorts of all Moody's-rated issuers with debt outstanding as of January 1 of each year, we replicate the experience of a portfolio of both seasoned and new-issue bonds purchased in a given year.

For each cumulation period, default rates based on dynamic cohorts express the ratio of issuers who did default to issuers who were in a position to default over that period. In terms of equation (1) above, this constitutes lengthening the time horizon to some terminal period T (T=11 in the case of one-year default rates), so that the numerator becomes the sum over *t*-T and *t*, and the denominator becomes $I_{k,t-T}$.

Cohort-based default rates can answer questions like "What was the probability that a Baa-rated issuer with bonds outstanding as of January 1, 1985 would default by the end of 1999?" The answer to this question – 8.46% – is found in Exhibit 43 in the appendix, in the last row and last column headed "15" of the section labeled Cohort Formed January 1, 1985. In cases in which an investor feels that the business conditions of the current year are similar to those of some previous year, she may consult that year's cohort directly to ascertain what default patterns to expect.

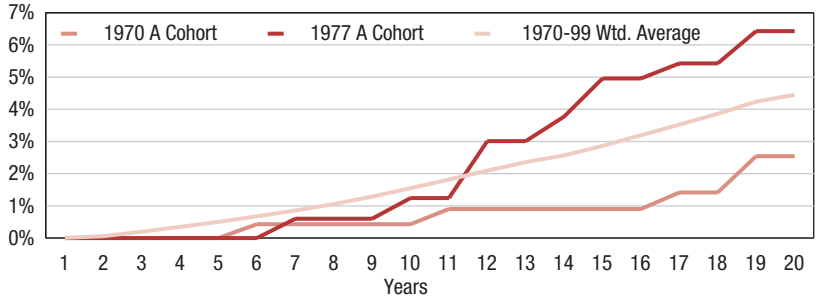
To estimate the average risk of default over time horizons longer than one year, we calculate the risk of default in each year since a cohort was formed. The issuer-weighted average of each cohort's one-year default rate forms the average cumulative one-year default rate. The issuer-weighted average of the second-year default rates cumulated with that of the first year yields the two-year average cumulative default rate. In this manner, we compute average cumulative default rates for one to 20 years for each rating category.

To illustrate how the weighted average smooths out the variations and irregularities in the default experience of individual cohorts, Exhibit 16 presents cumulative default rates from one to 20 years for two cohorts of A-rated issuers, 1970 and 1977, as well as for the weighted average cumulative default rate from 1970-present.

From Exhibit 16 it can be seen how each cohort formed produces a different credit history in response to different economic and market conditions. For example, the default rate for the 1977 A cohort jumped sharply above 2% 12 years after it was formed. Twelve years out occurred in 1989, the beginning of the infamous credit crunch and one of the highest default episodes in modern history. The 1970 A cohort didn't reach a 2% cumulative default rate until 19 years out, and this was again, 1989. By averaging these curves together, we obtain a cumulative default profile that averages over all economic conditions at each time horizon. The two separate cohorts embed the 1989 credit shock at two different points along the weighted average curve, but in fact, every point on the average curve contains the 1989 shock as contributed by a different cohort.

Exhibit 16 - Cumulative Default Rates for A-Rated Issuers

Weighted-Average Default Rates Smooth Economic Cycle Effects on Individual Cohorts



The Historical Performance of Moody's Ratings

Over 3,400 of the more than 16,000 corporate issuers that Moody's has rated since 1920 defaulted at some point in time. One year prior to default, less than 9% of these carried actual or implied senior unsecured ratings at the investment-grade level. However, at various lengths of time before default, more issuers carried investment-grade ratings.

To summarize the extent of rating decay in advance of default, we calculated the median and average senior or implied senior unsecured rating of issuers between zero and 60 months before default, shown in Exhibit 17. The average rating is constructed by translating Moody's rating symbols onto a scale from 1 to 21 where Aaa=1 and C=21 and simply taking the average of the numbers to produce a smooth series. While the value of this "average rating" has no simple interpretation, it can be translated back onto the original symbolic scale, and its changes do reflect improvement and deterioration in the underlying pool of future defaulters, capturing finer gradations than does the median rating.

Exhibit 17 - Median and Average Ratings Before Default, 1920-1999

Rating Decay Predicts Default

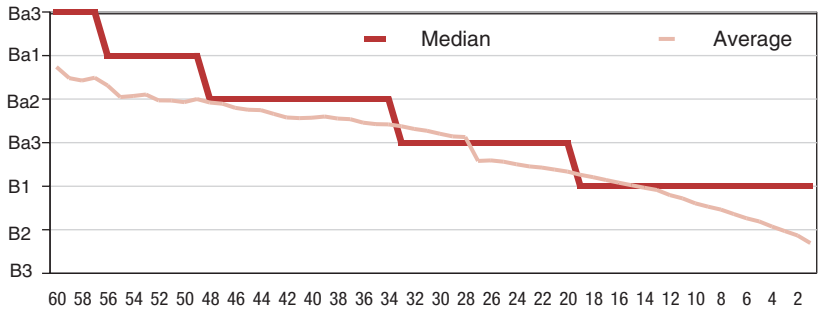


Exhibit 17 shows that, nearly five years prior to default, the median rating of defaulting companies is speculative-grade. The downward slope of the average shows that, as a group, these future defaulters are already seeing downward rating pressure five years in advance of default. At 33 months before default, the median rating has fallen to Ba3 and falls further to B1 eighteen months prior to default.

The average rating falls more gradually and farther than the median rating, reaching the B2 level four months prior to default. The average and median level of rating prior to default has continued to fall in recent years, as precipitous rating drops prior to default have been rare. For issuers defaulting in 1999, the median rating both one and two years prior to default was B2, well below the historical average.

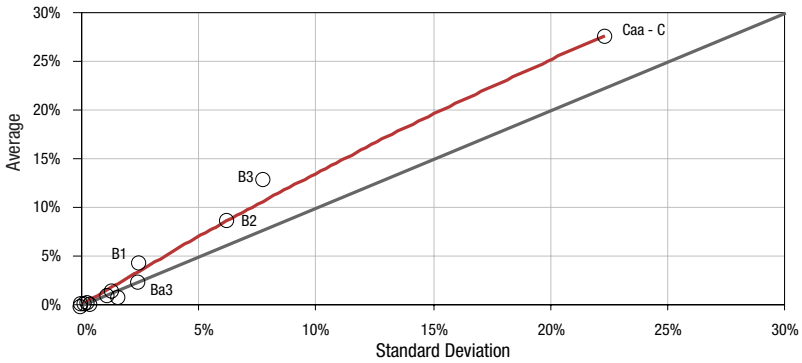
As one moves down the ratings scale, both the risk of default and default volatility increases. In other words, default risk increases, and the risk that the default rate will differ from the historical average also increases. Exhibit 18 captures this result. The vertical axis of the chart shows the average one-year default rate by alphanumeric rating categories. Default rates for investment grade-rated issuers are clustered around zero; defaults by issuers holding investment grade ratings within one year of the default date are relatively rare.

Default rates begin to increase moving down the rating scale to non-investment grade. The one-year default rate jumps from 0.59% for Ba2-rated issuers to 2.35% for Ba3-rated issuers. From B1 to B3 the default rate triples, and from B3 to Caa-C-rated issuers the rate triples again.

Looking at the horizontal axis of Exhibit 18, we also see that default rate volatility, the "risk of the risk" of default, increases with lower rating notches, though not exactly in the same proportion as average default risk. A polynomial function fit to these data is steeper than the 45-degree line and shows some concavity.

Exhibit 18 One-Year Default Rates by Alpha - Numerical Ratings, 1983-2000

Default Risk, Volatility Increases With Lower Rating Categories



Although one-year default rates tend to be of greatest interest to many market participants, some find default rates for longer time horizons more relevant. A 10-year default rate, for example, estimates the share of a portfolio of bonds that can be expected to default over a 10-year period.

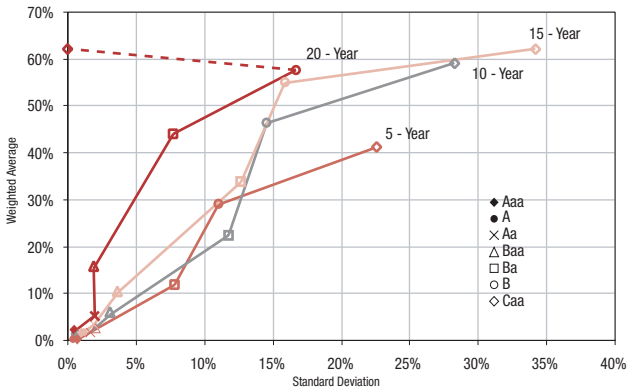
Exhibit 19 presents average cumulative default rates for 5-, 10-, 15-, and 20-year time horizons based on data since 1970. The chart is laid out similarly to Exhbit X, with the weighted average default rate on the vertical axis and the volatility of the default rate (standard deviation) on the horizontal axis. Lines connect the different default time horizons.

Higher default risk for lower rating categories remains evident over investment periods as long as 20 years. For example, average default rates for five-year holding periods climb from 0.2% for the Aaa rating category to 28.9% for the B rating category. Exhibit 19 also shows that the pattern recurs for average default rates for 10-year and 15-year holding periods. Exhibit 43 in the appendix presents these data in detail for the period from 1970 to the present, and Exhibit 42 presents average cumulative default rates by numerically modified ratings for up to eight years.

Default rate volatility increases with the time horizon as well as with lower ratings. For a given rating category, there tends to be a monotonic relationship between holding period and default volatility. For the B rating category, for example, default volatility increases from 11.0% at five years to 16.7% at 20 years.[15]

Exhibit 19 - 5-, 10-, 15-, and 20-Year Average Cumulative Default Rates and Volatilities, 1970-2000

Ratings Capture Default Risk & Volatility Over Long Time Horizons



The volatility of default rates has important implications for bond pricing. The returns investors earn on lower-rated debt must not only compensate them for the higher average risk of default, but also for the increased risk that the default rate could differ substantially from its historical average.

[15] *At the 20-year time horizon default rates tend to saturate and level off, making the standard deviation of default rates at this time horizon essentially zero.*

While Exhibits 18 and 19 show the relationship between ratings and default-rate volatility, standard deviations can be misleading for asymmetric distributions like default rates. For example, for a distribution of 100 observations with only one observation greater than zero, 99% of the observations will lie below the mean. To better quantify this volatility, Exhibit 38 in the appendix characterizes volatility by rating category in terms of quartiles (ranges containing 25% of the data) and extreme values, from 1970-2000.

Default Severity and Recovery Rates in Default

The bulk of this report focuses on the *rate* of default. This section deals with an equally significant statistic: the *recovery rate of defaults* (the opposite of a *loss given default*). This statistic has a wide variability covering the full range from essentially zero to a full 100% of par (or even somewhat more in rare cases). Yet, this statistic is traditionally analyzed in less detail since projecting recoveries from bankruptcy is necessarily confounded by the interjection of an administrative process rather than a market process.

For this report, we proxy the recovery rate as the secondary market price of the defaulted instrument one month after the time of default. These market quotes are from several dealers and represent an actual bid on the specific instrument, although no trade may have occurred at that price. This definition is closely aligned with investors who might wish to trade out of a defaulted instrument soon after the time of default. A separate investor "clientele" might well pursue the alternative strategy of acquiring defaulted paper. The recovery rate proxy that we use here can effectively act as a transfer price between these two investor groups. This methodology is consistent with all previous years of this annual default study.

We report these recovery estimates as a percentage of par. Investors' claims in default are commonly on the face value regardless of the investor's purchase price. Since discount bonds and convertible bonds have unique pricing features, we have removed them from this section of the report.

An alternative definition of recovery in default – not reported here – tracks all payments made in default and seeks to discount them back to the default date applying some (estimated) appropriately risk adjusted discount rate. In many cases, the value of certain types of securities (many of them non-traded) must be estimated before they are discounted to the time of default. For example, over 1/3 of recovery value for unsecured public debt derive from equity values – equities that are commonly non-traded.[16]

The principal determinant of recovery rate is the instrument type: bank loan vs. bonds vs. preferred stock. Secondarily, the security and the level of subordination of the instrument strongly influence recoveries. Beyond these, other factors such as a debt class's standing in the capital structure and the stage in the economic cycle are becoming more and more quantified. We report here that Moody's ratings at the time of default are also a predictor of recovery value.

Seniority/Security Structural Determinants of Recovery

The historical record shows that the seniority/security is a major determinant of value recovered in default. Exhibit 20 plots the distributions of recovery rates for each seniority/security of claim. Market prices (bids) are used to proxy recoveries over the period from 1981-2000. In these plots, the darkened boxes delineate the inter-quartile range (i.e., the central 50% of observations), while the "whiskers" further cover all but the statistical outliers (observations outside the 95th percentile), which in turn are shown as discrete bars. The solid white lines within the darkened boxes represent the medians (i.e., the 50th percentiles) of the distributions. Finally, the width of each seniority/security class indicates the size of our sample. The width is proportional to the square root of the number of observations.

For bank loans, the median recovery rate for senior secured is US$72 (US$64 average); for senior unsecured, the median price is US$45 (US$49 average). Senior unsecured bank loans is a new category not reported in previous annual default studies. For senior secured bonds, the median price is US$54 (US$53 average). The recovery value falls to US$44 for senior unsecured bonds (US$47 average), and to US$29 for subordinated bonds (US$32 average). Preferred stocks recover only US$15 (US$22 average). Exhibit 35 in the appendix provides additional detail on the statistical characteristics of defaulted bond recovery distributions.

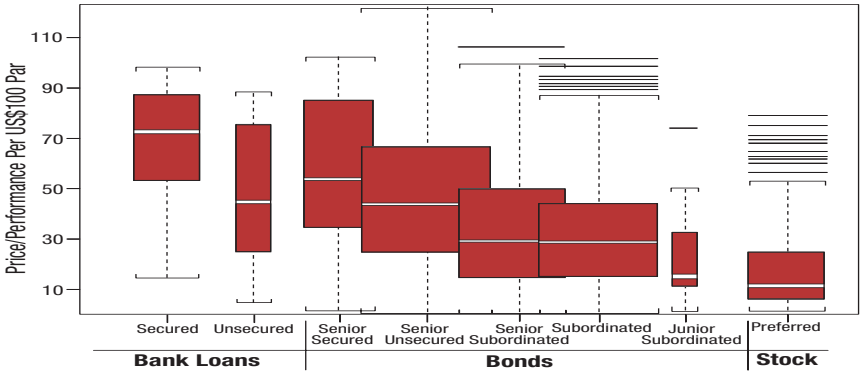
The strong trend of declining average recovery rates with declining claim priority supports Moody's practice of notching ratings where applicable for varying security claim priority. Generally speaking, if an

[16] *Refer to "Debt Recoveries for Corporate Bankruptcies," Moody's Special Comment, June 1999.*

obligor suffers credit distress, then all of its obligation – regardless of security/seniority – are at risk of default.[17] Thus, it is generally the case that different security/seniority classes face the same *likelihood* of default. As is shown in more detail below, Moody's rating practice addresses the differing credit loss experience by security/seniority class.

Exhibit 20 - Default Recovery Estimates by Moody's Rating at Default, 1981-2000

Seniority/Security Prime Determinants of Recovery



Defaulted bond prices exhibit a strong relationship across seniority/security classes that have also proven to be stable over time. This historical observation is a direct reflection of the "Absolute Priority Rule" that is the philosophy behind U.S. bankruptcy law, which states that senior claimants be paid off in full prior to the satisfaction of more junior claims. Although often violated in practice – bankruptcy court judges are empowered to accept negotiated claimants' filings or to pursue an equitable settlement – the rule of seniority/security largely prevails.

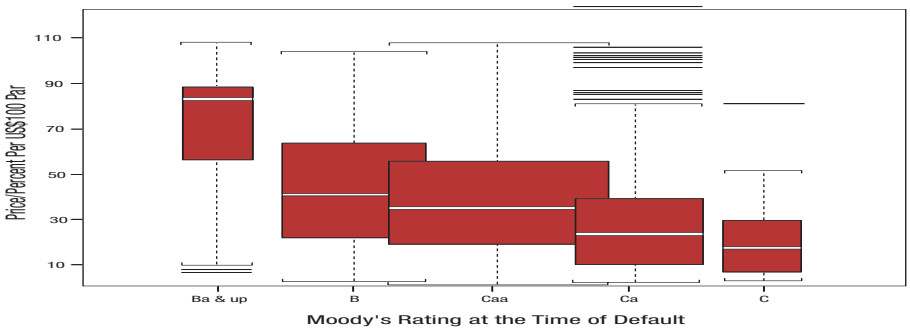
Nevertheless, as shown in Exhibit 20, over a portfolio of defaulted instruments there can and has been a considerable variation in those prices. While the median is a useful indicator to approximate the most likely bond price to arise from a particular default, it does not convey the broad range of possible outcomes. For example, while the estimated median recovery for all senior unsecured bonds is $44 per $100 par amount, values from $25 to $67 were common (the inter-quartile range) and the full experience extends from near zero to in excess of par.

Across debt types, median prices of defaulted bonds tend to fall as seniority declines, while variability in prices is widest for the most extreme seniority categories (high and low) but narrower for the middle categories. This effect is a natural consequence of all defaulted security prices being (broadly speaking) both *volatile but bounded* between zero and par.

Moody's Ratings at the Time of Default Predict Recoveries

Exhibit 21 - Default Recovery Estimates by Moody's Rating at Default, 1981-2000

Ratings for Defaulted Obligors Predict Recovery



[17] *Exceptions do occur such as a "technical default" due to the breach of some bank loan agreement such as a material change in certain accounting ratios. Such technical defaults are not included in Moody's definition of default.*

In addition to seniority and security, a Moody's rating at the time of default is strongly predictive of value recovered in default.

As described in the *Meaning of Moody's Ratings and Senior Implied Ratings* section, Moody's ratings are statements about expected loss, whose two components are the probability of default and the severity of default. When an obligor defaults Moody's does not assign a 'D' rating. Instead, the rating on a debt instrument following a default is an opinion on the issue's relative recovery value.

Exhibit 21 breaks out the recovery experience by Moody's ratings. This plot is of the same format as Exhibit 20 and shows the 1,400 instruments that had a Moody's rating at the time of default; Exhibit 20 covers 1,800 instruments.

Exhibit 21 shows a consistent pattern of declining value of defaulted securities (higher loss given default) with lower Moody's rating grades. As shown in the previous graph of recovery estimates by seniority/security class, there is the familiar pattern of wide variability in default recovery estimates within each group. However, the median values show a clear rank ordering across grades. The median for Ba and above is USD83 (USD70 mean). This group includes the few (6) securities rated Baa and A at the time of default. B-rated securities were markedly lower at a median of USD40 (USD44 mean). Caa-rated debt was the most populous grade valued with a median value of USD35 (USD39 mean). Ca-rated debt had a median value of USD21 (USD29 mean). Finally, C-rated debt came in at USD9 (USD16 mean). In all cases, the mean of each group is closer to the middle value of $50 versus the median of that group.

This value of Moody's ratings to predict rank ordering of average default values is evident not only in the large groupings shown in Exhibit 21 but also over time and within individual seniority/security categories, as shown in Exhibit 21.

Exhibit 22 reports the mean default recovery estimates cross-tabulated by security/security versus Moody's rating at default. Also, the most recent year is broken out versus historical. Certain cells and whole categories were suppressed if they did not have at least 10 observations. This cell suppression can lead to some subtotals not seeming to foot when in fact they are correctly including the few cells values that are not printed.

There are two major conclusions evident in Exhibit 22. First, that the strong rank ordering of default value along either seniority/security or Moody's rating class dimensions separately, is also evident between these two dimensions *jointly*. Second, that the recoveries for the most recent year, 2000, are not only broadly lower than in the past but also that they are consistently lower in the seniority/rating sub-categories.

Exhibit 22 – Average Defaulted Values, by Security & Rating, 2000 vs. Historical

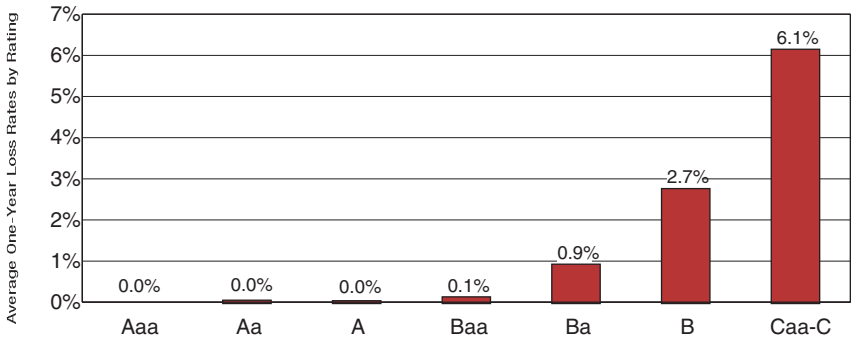
	1981-1999					2000					Grand
	B	Caa	Ca	C	Total	B	Caa	Ca	C	Total	Total
Bank Loan/ Sr. Unsecured	82.0	60.3			69.0		58.9			60.3	64.3
Bond/ Sr. Secured	61.7	57.2	50.7		55.3					38.8	53.9
Bond/ Sr. Unsecured	53.4	44.5	46.1		51.1		29.3	32.1		29.8	47.4
Bond/ Sr. Subordinated	42.3	37.3	32.3	16.2	36.0		28.7	13.9		20.5	33.3
Bond/ Subordinated	41.2	31.9	24.3		32.5						32.3
Preferred Stock	24.1	16.6	8.6		18.9						18.4
Total	44.1	38.7	30.0	15.8	40.0	35.6	40.5	25.5	15.8	33.2	39.1

One broad conclusion of this link between defaulted debt values and Moody's ratings at default is that downtrends in Moody's rating would generally predict increased losses in the event of default.

From Default Probability and Recovery Rates to Loss Rates

Moody's long-term debt ratings are statements about protections against credit loss. Credit loss rates are simply the default probability times one minus the recovery rate. Thus, expected credit loss depends in equal measure upon *both* the default probability *and* the severity of loss given default. As this report has examined, Moody's ratings do in fact capture both default probability and severity. Not only does the probability of default rise with lower ratings but also the severity of loss given default rises. Both of these factors consistently lead to higher credit losses for lower Moody's ratings.

Exhibit 23 - Average One-Year Credit Loss Rates by Rating Category, 1970-2000



Previous sections have detailed Moody's estimation of the historical average probability of default associated with each rating category. They have also detailed average recovery rates for different Moody's rating grades. By multiplying Moody's estimates of the likelihood of default by our estimate of the severity of loss, we can now derive estimates of the credit losses historically associated with each rating category.

Exhibit 23 indicates that expected credit loss increases dramatically as Moody's credit opinion slips from investment-grade to speculative-grade. We calculate these estimates by combining the 1970-2000 average default rates with the 1981-2000 average recovery rate estimate for Moody's rating grades. With our new analysis of recovery rates broken out by Moody's rating, this graph is further tailored to the loss experience by Moody's rating category. The marked increase in risk by crossing over from the investment to sub-investment grades (Baa and above vs. Ba and below respectively) dramatically illustrates the reason for investor wariness.

Appendix

2000 Default Rate Trends by Major Industrial Categories

Exhibit 24 – Broad Industry Default Rates, 1970-2000

Industry	2000	1970-2000 Average
Banking	0.15%	0.46%
Consumer Products	5.51%	1.34%
Energy	0.00%	1.47%
Financial (Non-Bank)	0.76%	0.81%
Hotel, Gaming & Leisure	4.68%	3.16%
Industrial	4.73%	1.37%
Media	2.37%	1.92%
Other	3.33%	0.86%
Retail	4.22%	2.44%
Technology	2.50%	1.24%
Transportation	3.63%	2.15%
Utilities	0.00%	0.10%

Exhibit 25 – Broad Industry Default Rate Correlations, 1970-2000

	Industrial	Banking	Consumer Products	Energy	Financial (Non-Bank)	Hotel, Gaming, Leisure	Media	Misc	Retail	Tech	Transport	Utilities
Industrial	1.00											
Banking	0.59	1.00										
Consumer Products	0.78	0.58	1.00									
Energy	0.37	-0.04	0.11	1.00								
Financial (Non-Bank)	-0.03	0.07	-0.04	-0.08	1.00							
Hotel, Gaming, Leisure	0.76	0.76	0.84	0.21	-0.03	1.00						
Media	0.52	0.48	0.40	0.00	-0.13	0.50	1.00					
Misc	0.56	0.38	0.48	0.12	-0.07	0.38	0.19	1.00				
Retail	0.54	0.40	0.58	-0.15	-0.16	0.52	0.46	0.43	1.00			
Tech	0.65	0.52	0.62	0.33	0.09	0.66	0.35	0.38	0.37	1.00		
Transport	0.25	0.16	0.25	0.09	0.81	0.21	0.06	0.18	0.08	0.30	1.00	
Utilities	0.31	0.54	0.43	-0.01	-0.08	0.48	0.31	0.45	0.60	0.31	0.05	1.00

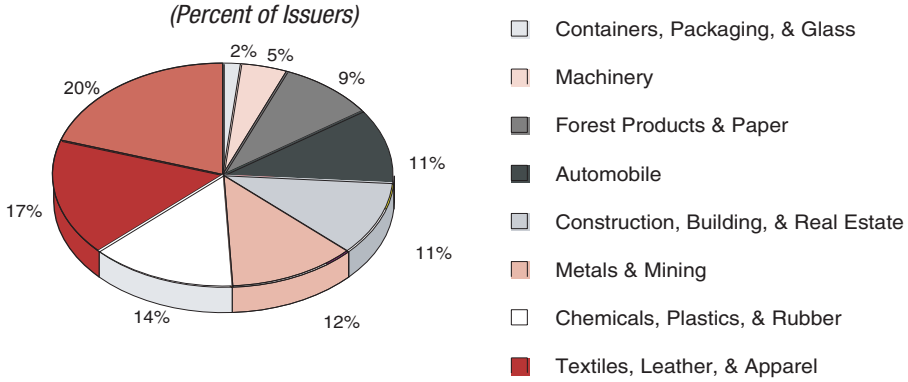
Industrials

The industrial sector experienced the highest proportion of defaults in 2000 (39% of the total number of issuers). Sixty-five issuers defaulted on a total of USD15.9 billion of outstanding debt. Of these 65 issuers, 54 were rated by Moody's at the time of default, totaling USD9.7 billion.

The industrials category encompasses many specific sub-industries, so it is useful to disaggregate the industrial sector to find out where defaults hit hardest. Nine specific industries included in the industrials category were affected this year. Exhibit 26 breaks out the defaulters in the industrial category into its constituent sub-sectors.

Exhibit 26 - 2000 Defaults for Industrial Sub-Sectors

(Percent of Issuers)



Healthcare contributed the most defaults to the industrials sector, with 13 issuers (comprising 19% of defaulting issuers) defaulting on a total of USD2 billion of debt. All the defaulting issuers were headquartered in the United States and 10 of them were rated.

Structural problems resulting from the Balanced Budget Act of 1997 that modified the Medicare reimbursement system negatively impacted providers of health care services. Nonetheless, a pull-back on consolidation activity, focus on operations, and greater success in maintaining or raising managed care rates are factors likely to strengthen the industry's credit condition.

On the other end of the spectrum, Paracelsus Healthcare Corporation, a Texas based hospitals operator, has been actively selling both non-core and core assets to help bring down its debt. Despite those significant restructuring efforts, Paracelsus remained highly leveraged and continued to record losses. It defaulted on its senior subordinated bonds in February 2000 and filed for Chapter 11 in September.

Managed care pricing pressure continues, although healthcare providers with clear local market strength have better success at maintaining or increasing rates, aided in part by a more favorable premium environment. Other issues that add to the sector's fragile condition include ongoing fraud investigations and cost control challenges.

The **Textiles, Leather, & Apparel** sector comprised approximately 17% of defaulters in the industrial sector, with 11 issuers defaulting on a total of $1.7 billion of debt. The eight rated defaulters are headquartered in the United States and Canada. Their weak operating performance stems from a combination of price pressures (mainly from Asia) and high leverage resulting from many ill-timed investments.

All rated and non-rated defaulters issued long-term public debt after 1997, underscoring once more the relative ease with each lenders could finance corporate expansion. Another striking observation is the extremely low average recovery rate for these defaulters, which stands at 18.2 cents on the dollar for 2000.

Changing fashion trends and consumer shopping habits are putting pressure on the sales, market shares, and margins of manufacturers using fabric such as denim jeans and the fabric from which they are made. The apparel manufacturers must deal with a polarization in demand for either high-fashion and high-price designer labels or to low-price private labels, the khaki craze, and the reduced importance of traditional department stores as a distribution channel for their products.

Textile manufacturers are faced with excess capacity and excess inventory, changing silhouettes that require less yardage of fabric, pressure from the apparel manufacturers to offer a wider range of services,

and pressure from offshore competition to lower costs. Industry pressures have resulted in negative rating actions including the downgrade of Galey & Lord, Inc and Burlington Industries, Inc.

The sector outlook in the Asian market, however, indicates that textile and apparel companies, such as Taiwan's Far Eastern Textile Ltd., one of Asia's largest polyester makers, will continue to show growing revenues. Although consumer demand remains uncertain given the shaky economic profile in the region, relocation of production sites from North American and European producers should ensure continuous sustained activity in this industry.

Chemicals, Plastics, & Rubber produced nine defaulters totaling USD1.1 billion of defaulted debt, with USD1.0 billion belonging to seven rated North American issuers. The industry was primarily hurt by onerous leverage stemming from the financing of several acquisitions. Lower product pricing strained revenue growth and exacerbated the sector's financial condition. 2000 also saw the largest proportion of defaulters in a decade.

The dramatic increase in oil and gas prices has had a negative, but uneven impact on companies across the industry. Leveraged companies tend to be less diversified and/or heavily dependent on commodity petrochemicals or petroleum derivatives. This is especially true of companies like General Chemical, Huntsman Corporation, Pioneer and Mississippi Chemical. In December 2000, Pioneer Corporation of America, a Texas based chlor alkali (chlorine, caustic soda and related products) producer, defaulted on its bonds partly because of continuing pressure on its chlor alkali product margins, stemming from significantly higher energy costs.

Furthermore, many US companies in the sector with high exposure in Europe have been negatively impacted by the sustained decline in the value of the Euro, exacerbating the fall in profits. In Europe, companies have experienced a modest benefit from a significant increase in sales offset by higher US dollar based feedstocks and energy costs. Access to low cost raw materials remains key to global competitiveness over the longer-term and accounts for the large number of new projects in the Middle East and several in Asia and South America.

Over the last two years, the European chemicals landscape has changed dramatically due to the mergers of oil and energy companies, the creation of large commodity chemical joint ventures/alliances and the emergence of buyers for commodity and specialty assets. Oil company mergers and large commodity joint ventures will result in the closure of smaller less profitable sites and increases in capacity at sites providing integration with refineries (oil companies) or easy access to feedstocks. This should address a significant portion of Europe's historically uncompetitive cost-structure compared to its North American rivals. However, exposure to higher-cost raw material feedstocks will remain.

Metals & Mining contributed eight defaulters, six of which were rated with USD1.6 billion in debt outstanding. All were based in the US except for Australia-based Bulong Operations Pty Ltd.

US companies in the sector have been in a malaise for the last three years. Lower steel and other metal prices resulting from intense competition from overseas imports, along with higher raw material and energy costs, have adversely affected the sector's credit condition.

November 2000 alone saw three issuers defaulting on rated debt, two of which filed for Chapter 11. One of them, Metal Management, Inc., located in Chicago, is one of the largest full-service metals recyclers in the nation and has suffered from weak scrap metal demand as well as reduced prices in domestic steel markets. Moreover, the rapid expansion through debt-financed acquisitions choked the company with leverage.

Steel industry production has slowed in part because of weaker auto sales, particularly in the US. Nevertheless, certain firms have already taken action to reduce galvanized steel production (used in the automotive and construction industries) in order to alleviate rising inventories and falling orders as a result of soft North American and overall OECD automobile markets.

Recent rating downgrades in the sector have been due to high leverage, limited liquidity, significant refinancing risk, and weak cash flow. The mining industry is vulnerable to volatile prices and industry cycles, and subject to a high degree of reserve, operating, environmental, regulatory and political risk.

The **Automobile** sector contributed seven defaulting issuers to the industrial sector totaling USD3.4 billion. The five rated issuers were headquartered in the United States and defaulted on a total of

USD640 million of debt. Globally, the largest default in the sector was Daewoo Motor Company Ltd. with approximately USD2.5 billion in outstanding debt.

The Asian financial crises, which began in the fourth quarter of 1997 and resulted in a sharp slowdown in auto demand in emerging markets, reversed a previous trend towards increasing numbers of producers attempting to enter the automobile manufacturing industry. The consolidation of auto manufacturers in Korea is a case in point. Over the past two years, two of Korea's five largest producers have been sold to other larger Korean auto companies. First, Sangyong Motor was sold to Daewoo in 1997 and, more recently, Hyundai Motor, along with other Hyundai Group companies, agreed to purchase Kia and Asia Motors.

Korean producers have experienced dramatically lower costs of production compared to global competitors with the depreciation of the Korean Won. Nonetheless, the overall weakness in demand for economy cars, a niche where Korean auto makers are strongest, has impaired the necessary profits on export product to offset the losses on domestic operations caused by the severe drop in demand in their home market. Ill-timed massive debt-funded investments coupled with weak operating and financial performance resulted in unsupportable indebtedness.

The US automobile market has been experiencing operating and financial problems caused partly by economic factors such as higher fuel costs, tight competition, and a weak Euro (hurting overseas exposure). Moreover, significant integration difficulties stemming from numerous debt-financed acquisitions led to excessive leverage. Large global automakers are searching for higher volumes by expanding both their geographic coverage and their product line breadth. While the economic slowdown in emerging markets reversed the trend of new entrants into the automobile industry, the 1998 merger between Chrysler Corporation, the sixth largest auto producer, and Daimler-Benz AG, the fifteenth largest producer, highlighted the trend towards consolidation of larger auto producers in developed markets.

As soft demand persists in the sector, North American, European and Japanese automakers have taken action to reduce auto production in their respective territories. This trend shows no sign of improving in the near term, as GM recently announced that it planned to idle 12 plants, affecting more than 25,000 employees with Ford and DaimlerChrysler also implementing production cuts.

Three US rated issuers defaulted in the **Construction, Building, & Real Estate** sector, all of which filed for Chapter 11.These defaults totaled USD2.1 billion, compared to a total of USD4.5 billion attributed to four non-rated companies principally located in Asia.

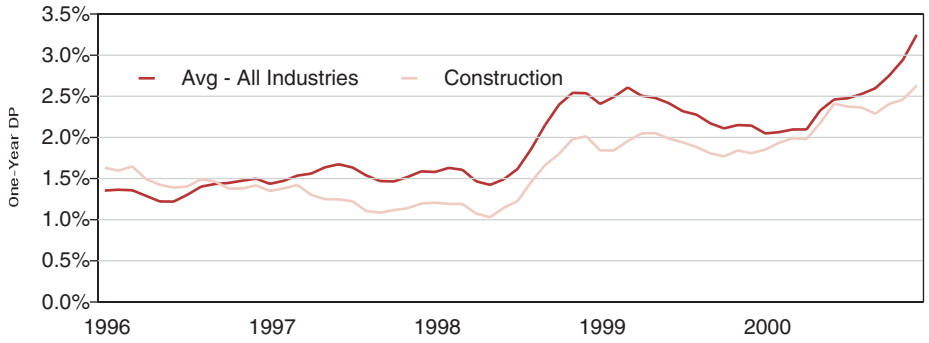
Korea saw its top two construction contractors crashing in the face of mounting debt levels. The failures of Hyundai Engineering & Construction Co. Ltd. and Dong Ah Construction Industrial Co. Ltd. signal that the government and lenders are taking a tougher stance on cash-strapped companies.

Two large defaults in 2000 occurred in the Construction, Building, & Real Estate sector, and both were the result of event risk associated with legal claims. The Chapter 11 filing by Owens Corning, totaling USD1.3 billion of debt, was followed by Armstrong World Industries, Inc., whose bond debt claims totaled USD655 million. Their downfall is largely attributed to asbestos liability claims which, through the National Settlement Program in 1998, ballooned to unexpected levels.

Many US construction companies have expanded aggressively since 1997, primarily through issuing debt, and are confronted today with burdensome leverage and poor cash flow caused by higher raw material costs and soft market conditions for building products. Exhibit 27 presents the average Default Probability (DP) for the construction sector. Although below the average for all industries, the construction sector nevertheless has shown increasing default risk over 2000.

Exhibit 27 - Moody's RiskCalc Index for Construction Sector

Construction Sector Shows Future Increasing Credit Risk



Technology

The Technology sector, which includes Telecommunications, Electronics, Aerospace & Defense, produced 23 defaults totaling USD8 billion.

Fourteen rated issuers (70% of total dollar volume) defaulted on USD5.6 billion of debt outstanding. All rated companies except for Colombia-based Transtel Pass Through Trust and U.K.-based Esprit Telecom Group Plc, are headquartered in the United States. Eight of the 14 defaulters filed for either Chapter 11 or Prepackaged Chapter 11. The nine non-rated defaults all filed for bankruptcy.

Shifts to new technologies that either quickly became obsolete or had negative market impact, along with unsuccessful integration efforts from recent debt-funded acquisitions, toppled some very high-profile telecommunication companies.

The outlook for telecoms is heightened by the risks associated with rapid changes in technology. Those risks are magnified by the capital-intensive nature of the industry. Unprecedented amounts of debt raised to fund takeovers and investment in new technology such as 3G (Third Generation) wireless communication or UMTS (Universal Mobile Telecommunications System), particularly in Europe, could impair the financial flexibility of certain highly leveraged companies. In Europe, estimated 3G costs vary significantly according to the size of the national market and whether an auction, a 'beauty contest', or a combination of both is involved in the license allocation process. In Finland, 3G licenses were awarded by the government at no cost. In the UK, the 3G auctions wrapped up with accepted bids for prime nationwide licenses ranging from USD6 billion to over USD9 billion.

Exhibit 28 - Moody's RiskCalc Index for Communications Sector

Communications Sector Shows Higher Relative Default Risk in 2001

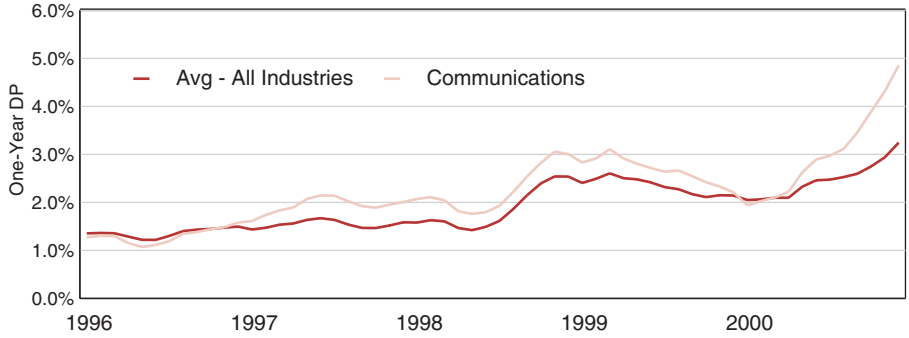


Exhibit 28 present the one-year DP for companies in the communications sector. The risk of default for these companies stands almost two full percentage points above the all-industry average.

Consumer Products

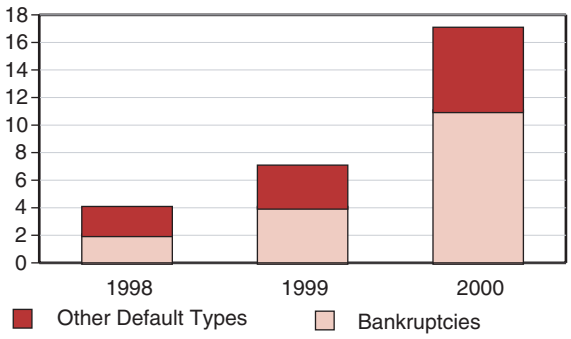
The Consumer Products sector includes Beverage, Food, & Tobacco as well as Non-Durable Consumer Products. Seventeen issuers defaulted on USD3.6 billion, 13 of which held a Moody's rating representing 64% of the total dollar volume of defaults.

The sector included the defaults of AmeriServe Food Distribution, Inc., Ameriserve Finance Trust and their parent Nebco Evans Holding Company. Eleven defaulters of 16 North American-based entities and one Indonesia-based company (DGS International Finance Company B.V.). Exhibit 29 shows that bankruptcy has become more common in this sector.

The majority of obligors defaulted on debt that was issued after 1996, mostly in the Beverage, Food, & Tobacco category, The industry has generally suffered from massively leveraged structures that were impaired by the cost of new operating systems, unprofitable acquisitions and their ensuing integration problems, as well as heightened competition.

Over the past twelve months there have been 23 downgrades in the food industry sector, compared to only five upgrades. Overall, the outlook for food and agribusiness companies is negative. Among the major food companies, the continuing high merger and acquisition and share repurchase activity (e.g. Unilever and BestFoods, Philip Morris and Nabisco, General Mills and Pillsbury, Kellogg and Keebler, Cadbury Schweppes and Snapple, and ConAgra and International Home Foods) is leading to deteriorating debt protection measures and increased integration risks. In addition, the continuing difficult conditions in commodity agricultural markets have depressed profitability and weakened credit measures for a number of commodity food processing companies and agricultural cooperatives such as Cuddy International Corporation, which defaulted in June 2000.

Exhibit 29 - Consumer Products
Sees More Bankruptcies



Overall, for most consumer products companies, declining revenues and shrinking margins will be a challenge. Many companies realize most of their sales in developed countries. In these markets, slowing economic growth could limit the portion of disposable income that households devote to consumer products. In some markets these expenditures are already stagnant or in some cases declining.

Hotel, Gaming, & Leisure

Hotel, Gaming & Leisure produced thirteen North American issuers defaulting on USD3.5 billion. Rated issuers comprised nine of these defaults totaling USD3.4 billion.

The sports and recreational business contributed the largest amount (USD1.3 billion), coming from AMF Bowling, Inc. and its subsidiary AMF Bowling Worldwide, Inc.

The theatrical exhibition industry contributed four defaulters totaling USD1.4 billion, of which 3 filed for Chapter 11 (United Artists Theatre Company, Silver Cinemas International, Inc., and Carmike Cinemas, Inc.). The last issuer that defaulted in the motion pictures industry was Carolco Pictures, Inc. in 1994, a sign that the sector is restructuring not only its indebtedness but also its market segmentation and business strategy. Many movie exhibitors embarked on a program of closing under-performing theaters and renovating and increasing screen counts at their remaining theaters.

Subsequent indebtedness and poor working capital from the continued deficiency of their aging theater network and a rampant competitive operating environment led to their inability to service debt payment requirements. Their decision to file for Chapter 11 enables them to temporarily suspend suffocating long-term lease obligations. The USD1.4 billion of defaulting debt in the theatrical exhibition industry was issued after 1998.

Transportation

The transportation industry experienced a shift in the business composition of this year's list of defaulters. 2000 saw nine issuers unable to service USD3.4 billion in outstanding debt. Six of them are based in North America while the three others are located in Cyprus, Hong Kong and Korea. Moody's rated 7 of these defaulters, which are clustered in the airlines or airfreight sector (40%), in contrast with the domination of ocean shipping companies that contributed more than 80% to the sector during 1999.

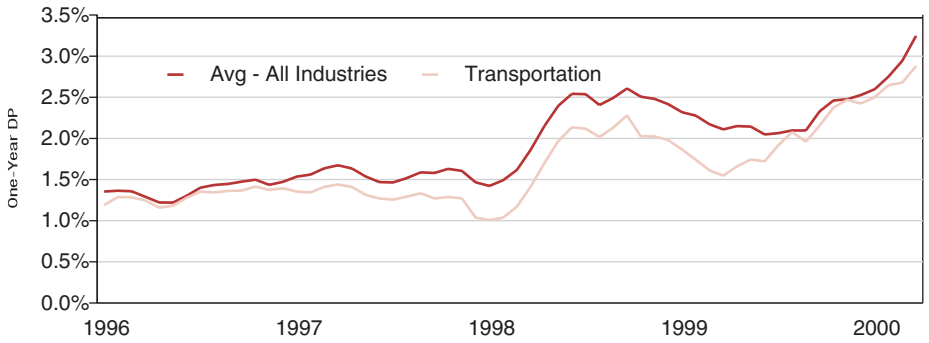
Laidlaw, Inc., the largest bus transportation operator in the nation defaulted on over USD2 billion of long-term public debt, or 60% of the total defaulted debt in the sector. Saddled by the debt burden resulting from several debt-financed acquisitions and hurt by a very weak cash position (resulting from losses in its health care subsidiaries, including Safety-Kleen Corporation), the company faced a liquidity crisis.

Overall, transportation was hurt by cumbersome leverage, aging equipment (aircraft, vessels, etc.), over capacity and higher fuel prices. While these problems affect the entire airline industry, different geographic regions are in different stages of their operating cycles. The primary bright spot is Asia. Recovering from the economic difficulties of 1997, Asian airlines and those long haul carriers with Asian exposure have begun to see improvements that will likely continue beyond 2000. The North American airline market is signaling some patterns of distress. In the Canadian Airlines case, severe competition from both Air Canada (who later acquired the company) and smaller regional and charter airlines resulted in poor operating results. Additionally, unsuccessful cost cutting measures and a revamping of the route structure led to the airline carrier's demise. This downward trend is further evidenced by the very recent TWA Chapter 11 filing. Exhibit 30 shows that the risk of default, represented by the Default Probability has increased for the sector, although it is slightly lower than the overall average.

In Europe, airlines continue to feel the impact of deregulation. The environment is highly competitive, with a number of new low cost airlines competing for intra-European traffic. The need to adjust to a new market dynamic is leading to industry consolidation and changes in operating environments.

Exhibit 30 - Moody's RiskCalc Index for Transporation Sector

Transportation Companies Show Increasing Default Risk



Retail

Eight issuers defaulted in the retail industry, defaulting on a total USD1.4 billion, of which USD1.3 billion was rated, represented by 5 companies. Four of them are based in the US, and all filed for Chapter 11 (including Pathmark Stores, Inc.). The fifth, Puerto Rico-based Pueblo Xtra International, Inc., agreed to a distressed exchange with its bondholders. Two of the four rated bankruptcies emerged from Chapter 11 within a year of their initial default (Pathmark Stores, Inc. and Eagle Food Centers, Inc). Those issuers have been challenged by factors such as increasing competition, unprofitable debt-financed acquisitions and square footage expansion. Slower economic growth in the US, with the attendant pullback in consumer spending, could to impact retailers and widen the gap between the stronger and weaker operators.

Downgrades are likely to outpace upgrades by a significant margin. Additionally, rating changes could be more frequent as a less forgiving economic environment is likely to exacerbate volatility in operating performance. Even in the best of economic times, the volatile nature of some retailing segments, an over-aggressive expansion strategy, fierce competition and/or an inability to respond to changing consumer

trends have eroded the credit quality of some retailers and have resulted in rating downgrades. JC Penney, for example, continues to struggle to persuade its customers to return to its department stores, as well as to turn around its drug store business. Similarly, Rite-Aid's poorly executed and overly ambitious expansion strategy has left it highly levered and with weak cash flow.

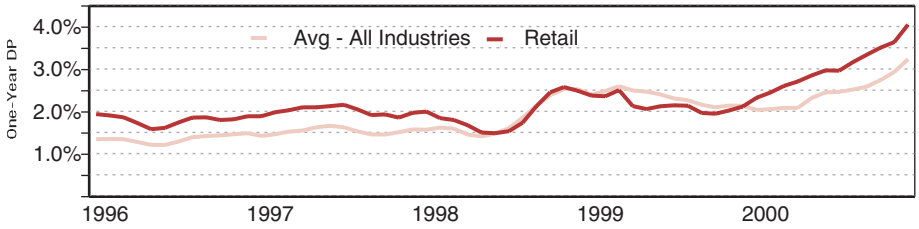
The Internet still represents a relatively small amount of retail sales. In 1999, e-commerce accounted for about 1.6% of U.S. retail sales (roughly USD36 billion dollars), some of which likely came from established catalog companies.1999 saw consolidation among pure-play Internet retailers as the capital markets closed their pocketbooks to dot-com companies that did not show a clear path to profitability. A number of well-publicized names, including Boo.com, ValueAmerica.com, and Miadora.com, went into bankruptcy. Toysmart.com, an affiliate of Disney, liquidated in mid-2000.

Others have merged, such as Pets.com and Petstore.com, or have been acquired by traditional companies that could inject capital. CDNow's acquisition by Bertelsmann and Ahold's investment in Peapod fall into this category.

Average default risk for the retail sector is higher than the all-industry average, as seen in Exhibit 31.

Exhibit 31- Moody's RiskCalc Index for Retail Sector

Retail Sector Credit Risk Increased Before all Industries



Banking

The banking sector experienced seven defaulters, of which only one was rated (Tianjin International Trust & Investment Corporation), totaling USD964 million.

The Asian financial crisis that burst in late 1997 had a direct adverse impact on the regional banking sector, which had extensively invested in numerous projects financed by foreign currency denominated debt. Depressed demand spread in most economic sectors and local currencies' depreciation hit banks' ability to service debt coverage. Additional borrowing to continue to support banks' operations was unavailable and significant customer withdrawals precipitated the banking sector to experience a liquidity crunch.

In the US, the Banking sector is showing growing concerns over debt spreads that have widened, even for some highly rated banks. The market is skittish, because asset quality is eroding, regulatory behavior is vigilant, liquidity is tightening, and there are clear indicators that the banks are entering the late phase of the credit cycle. Bank of America (BofA), which is particularly exposed to leveraged loans, stated in December 2000 that it would take a charge against fourth-quarter earnings because it was writing down USD1.2 billion in bad loans.

The trend for loan ratings continues to be negative. Moody's has downgraded more loans than it has upgraded for 14 consecutive quarters. The ratio of downgrades to upgrades ended 2000 at a 4:1 ratio.

Banks' exposure to the telecom sector is an area of particular concern. This year telecom represented about 25% of new syndicated loan volume in the US, and about 40% in Europe. There are a few sub-sectors in telecom that show particularly low credit quality as reflected in their Moody's rating, including paging companies, and emerging competitive players. Although most telecom issuers are rated investment grade, a significant portion of the telecom bank loans made over the past two years were to companies that are not yet cash-flow positive and require further capital infusions to fund their plans. In Europe, it is dif-

ficult to measure bank's exposure to areas such as telecoms due to the fact that banks' public disclosure and policy statements on their telecom exposures are more limited.

A possible fall in pretax and pre-provision earnings could come about through a reduction in lending growth, increased costs related to carrying non performing loans, and a likely drop in trading income. In some cases, banks have been lending on more of an asset basis than on a cash flow basis. In the future, the banking sector could be impaired by sectors that have already experienced high default rates, such as technology, consumer products, and Construction, Building, & Real Estate.

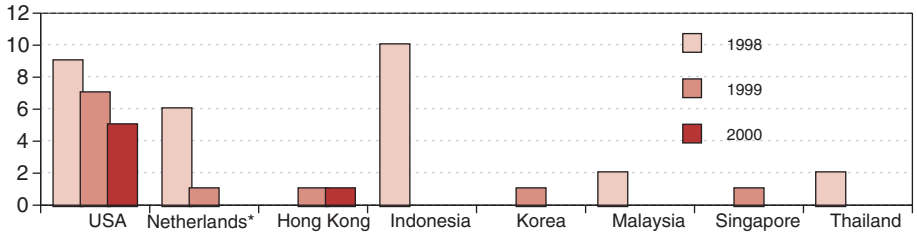
Financial (Non-Bank)

The Financial (Non-Bank) industry produced six defaulters in 2000 - all rated — defaulting on nearly USD2.5 billion, five of them are headquartered in the United States. with ContiFinancial Corporation contributing the largest portion in terms of dollar amounts ($700 million). Zhu Hai Highway Company Limited, the Hong-Kong based special purpose entity to raise financing for infrastructure investments on behalf of the Municipality of Zhu Hai suffered from poor operating cash flow due to declining economic growth in Zhu Hai and the surrounding region.

Overall, the financial sector, which is sensitive to the economic environment, succumbed to a liquidity shortfall as investor flight to quality following the Russian and Asian debt crises in the summer of 1998 and mid-1997. The crisis had a virtual domino's effect that is reflected geographically and chronologically in Exhibit 32.

Exhibit 32—Geographic Distribution of Defaulters 1998-2000

Defaults Shifted from Asian Markets to US in 2000



*NB: Most Dutch defaulters are the financial subsidiaries of Asian-based entities.

Media

Six issuers contributed the Media industry, five held a Moody's rating corresponding to 83% of this total and four of them were based in the United States. The Media default universe amounted to $790 million. The sole non-US rated defaulter was Bermuda-based Central European Media Enterprises, Ltd. which owns and operates television networks and stations in Central and Eastern Europe with corporate offices in London, England.

In general, the sector was negatively affected by heavy leverage combined with high start-up costs that produced disappointing revenues. The media sector includes the television and radio broadcasting, pay television, publishing, and outdoor advertising sub-sectors. With the exception of pay television, the performance of the most media companies is substantially influenced by the advertising spending environment. Since recent signs indicate that advertising spending has softened in anticipation of a slowing economy, Moody's believes that several ratings and ratings' outlooks will be subject to downward pressure because of weaker realized cash flows. Many high yield media companies remain saddled with meaningful leverage after a period of substantial consolidation. However, Moody's believes that media ratings will be continue to be buttressed, on the downside, by the substantial valuations of the media companies.

Utilities

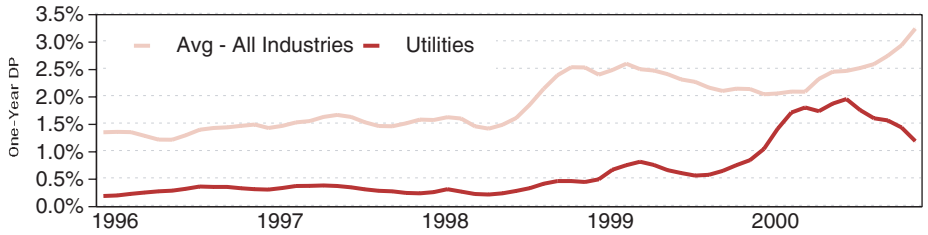
One issuer defaulted in the utilities industry in 2000. Rated Panda Global Energy Company defaulted through a distressed exchange largely as a result of tariff disputes with the government regulator of power for the Luannan power plant in China which prevented the company from generating sufficient cash flow to meet its financial obligations.

California is currently undergoing a serious crisis in its electric utility market, deregulated since 1996. This deregulation stipulated that the state's utilities had to buy energy on the spot market but charge customers a fixed rate. Within the last few months, prices for net power purchases are well in excess of the revenue received by customers under their tariff. The utilities are recording these power costs in a separate balancing account that is funded by short-term debt. The level of short-term debt is expected to increase over the next two years, particularly if power prices remain at or near the levels experienced over the past few months. Southern California Edison Company defaulted on payments to bondholders on January 16, 2001.

Overall the North American sector faces increasing capital expenditures to build new generating plants and to comply with tightening environmental regulation, as well as growing amounts of leverage -both on and off of the balance sheet -to fund new acquisitions. These challenges also include both the threat of overcapacity in regions such as New England and Texas, where substantial new construction is underway, and extreme power shortages in California, which has pushed the envelope for re-regulation. Despite these fundamental factors, the default risk for a broad cross-section of utilities has subsided in 2000 (see Exhibit 33).

Exhibit 33—Moody's RiskCalc DP Index for Utilities

Default Risk for Utilities Has Recently Subsided



Moody's Approach to Forecasting Default Rates

Moody's default rate forecasting model has received much attention in this environment of rising default rates and increased credit risks. In this section we briefly outline the model and its explanatory variables with the hope that transparency will help investors understand how the model works and what the forecast means. We also hope that it will dispel some misunderstandings and misperceptions about the model. The full detail and specification of Moody's default rate forecasting model was presented in a June 1998 special comment. Investors wanting a deeper understanding of the model are recommended to read that report.

Before understanding how Moody's default rate forecasting model works, one needs to thoroughly understand the methodology behind Moody's trailing twelve-month default rates. That methodology was laid out in the Calculating Default Rates section above.

Most of the total variation and nearly all of the short term variation in default rates comes from changes in the number of defaulters over the past year, which is represented in the numerator in equation (1). The denominator, consisting of the gross number of issuers minus the average number of withdrawals over the past 12 month, is a less volatile time series. In fact, the gross number of issuers in the denominator is known with complete certainty twelve months in advance in our framework.

Fortunately, there is a fairly stable historical relationship between the gross issuer count – the known quantity – and the adjustments. The adjustments have averaged about 4% and 2% for the speculative-grade and all-corporate categories, respectively. We therefore simply extrapolate this percentage using a simple autoregressive model to forecast the withdrawal adjustments over the known component of the denominators.

With the denominator of the default rate forecast to a high degree of reliability, we can turn our attention to forecasting separately the terms of the summand in the numerator (the number of defaults we expect to occur in forward months). These are the specific unknown quantities with which we can project the issuer-based default rate 12 months into the future.

To predict default counts, we need a statistical technique that will efficiently model non-negative integer values as a function of a set of explanatory variables. Because the number of potential defaulters is known, and because we can assume that the correlation of default events is small, the multinomial distribution would be a natural basis for such a model. In this case however, the number of defaults represents only a small fraction of the number of issuers, and so the multinomial distribution will be asymptotic to the Poisson distribution, which is easily represented in a regression model.

Our model assumes that each month's count of bond defaulters is drawn from a Poisson distribution with parameter lambda:

Thus, the probability that the number of speculative-grade defaulters in May is *n*, for example, is given by

$$\Pr(Y_i = y_i) = \frac{e^{-\lambda_i} \lambda_i^{\,y_i}}{y_i!}, \quad y_i = 0,1,2,\ldots. \tag{2}$$

The mean of the Poisson distribution is λ and its standard deviation is $\lambda^{1/2}$. Thus, (dropping the "spec" subscript for convenience) we want to find a formula for estimating λ_i — the Poisson parameter in each month i.

$$\Pr(Y_{Spec,\,May} = n) = \frac{e^{-\lambda_{Spec,\,May}} \lambda_{Spec,\,May}^{\;n}}{n!}. \tag{3}$$

A good estimator for λ_i is one that makes the expected number of defaults in each month, using equation (2), as close as possible to the number of defaults that actually occurred. In order for the model to be a forecasting model, we can only use lagged observable variables in constructing our estimator for λ_i.

We use the log-linear version of the model, in which the log of λ_i is a linear function of other variables, i.e.:

where xi is a vector of explanatory variables, and b is a set of coefficients which is estimated using maximum-likelihood.

$$\ln \lambda_i = \beta' x_i, \tag{4}$$

The log-linear formulation induces additivity on the right hand side of equation (4), which allows us to obtain separate coefficients for each variable we include. For example, if the model includes two variables – the percentage of issuers with speculative-grade ratings and industrial production – we would have

$$\ln \lambda_i = \beta_1 * \%speculative - grade + \beta_2 * industrial\ \ production. \tag{5}$$

The current specification of Moody's default forecasting model includes six variables plus an intercept and interaction terms. The model includes:

1. Percent of the corporate bond universe rated speculative grade
2. Percent of the speculative grade universe rated Ba or below
3. Real Industrial Production (i.e. IP deflated by the Producer Price Index)
4. New speculative-grade issuers weighted by the historical hazard default rate
5. Ten year Treasury yield
6. Treasury bond/bill spread

Moody's default forecasting model also accounts for the well-known aging effect. This theory posits that the hazard rate of default is a function of time in the market for new issuers. For each issuer, the theory goes, a critical period will be reached when the success of the enterprise is most uncertain and, consequently, the risk of default is at a maximum. If the issuer's plans are successfully implemented and begin to generate sufficient revenues to pay down the debt, the critical period has been survived and the probability of default falls.

Using our historical default database of defaulters, we found that the hazard rate of default did indeed start low, rising rapidly to a peak at about four years, then decreasing almost as rapidly out to about 10 years. We therefore account for the effect of lagged new issuance by including in the regression a weighted sum of lagged new issuer counts (variable 4 in the list above), where the weights are given by a smoothed historical hazard rate curve. We incorporate the same weighted sum of total new speculative-grade issuer counts into the forecasting equations for both the all-corporate and speculative-grade default rate series.

The modifications made to the senior ratings algorithm described in the section above will impact the default rate forecasts going forward. The new reported forecasted default rates will be based on the new, revised default rate times series. Comparisons of previous forecasts to the new default rates will, therefore, be invalid. Moody's plans on revisiting and evaluating the forecasting model's performance in separate report sometime in 2001.

Exhibit 34 - Chronological List of 2000 Defaulters

Company Name	Defaulted Amount	Default Description	Legal Domain
January			
AmeriServe Finance Trust	$205.00	Suspension of payments	United States
AmeriServe Food Distribution, Inc.	$850.00	Chapter 11	United States
Applied Magnetics Corporation	$99.00	Chapter 11	United States
Imperial Home Decor Group, Inc.	$125.00	Chapter 11	United States
Nara Investment Banking Corporation	$46.59	Suspension of payments	Korea
Paging Network, Inc.	$1,182.18	Missed interest payment	United States
Pen-Tab Industries, Inc.	$75.00	Missed interest payment	United States
Safety Components International, Inc.	$90.00	Missed interest payment	United States
Styling Technology Corporation	$100.00	Missed interest payment	United States
Ukraine, Government of	$1,063.56	Missed interest payment	Ukraine
Total (USD Millions)	$3,836.33		
Number of Defaulting Companies	10		
February			
Canadian Airlines Corporation	$275.00	Missed interest payment	Canada
CareMatrix Corporation	$115.00	Grace period default	United States
CellNet Data Systems, Inc.	$889.13	Chapter 11	United States
Eagle Food Centers, Inc.	$100.00	Chapter 11	United States
Lexington Precision Corporation	$31.72	Missed principal and interest payments	United States
Nebco Evans Holding Company	$100.39	Chapter 11	United States
Paracelsus Healthcare Corporation	$325.00	Missed interest payment	United States
PennCorp Financial Group, Inc.	$150.00	Chapter 11	United States
Phase Metrics, Inc.	$107.00	Missed interest payment	United States
Prime Succession, Inc.	$100.00	Missed interest payment	United States
Sewoo Polymer Company	$15.89	Receivership	Korea
Tops Appliance City, Inc.	$38.00	Chapter 11	United States
Uniwear S.A.	$17.21	Bankruptcy	Belgium
Total (USD Millions)	$2,264.34		
Number of Defaulting Companies	13		
March			
Crown Paper Company	$250.00	Missed interest payment	United States
Crown Vantage, Inc.	$95.99	Missed interest payment	United States
Grant Geophysical Incorporated	$100.00	Distressed exchange	United States
Ivory Coast	$2,322.57	Missed interest payment	Ivory Coast
Key Plastics, L.L.C.	$125.00	Missed interest payment	United States
LaRoche Industries, Inc.	$175.92	Missed interest payment	United States
Morris Material Handling, Inc.	$200.00	Missed interest payment	United States
President Casinos, Inc.	$75.00	Missed interest payment	United States
Read-Rite Corporation	$345.00	Missed interest payment	United States
Sunshine Mining & Refining Co.	$48.52	Missed principal and interest payments	United States
Sunshine Precious Metals Inc.	$25.98	Missed principal and interest payments	United States
System Software Associates, Inc.	$138.00	Missed interest payment	United States
United Homes, Inc.	$6.83	Chapter 11	United States
Total (USD Millions)	$3,908.81		
Number of Defaulting Companies	13		
April			
AmeriComm Direct Marketing, Inc.	$100.00	Chapter 11	United States
CHS Electronics, Inc.	$200.00	Chapter 11	United States
Clark Material Handling Company	$150.00	Chapter 11	United States
DIMAC Corporation	$100.00	Chapter 11	United States
Einstein/Noah Bagel Corporation	$125.00	Chapter 11	United States
Employee Solutions, Inc.	$85.00	Missed interest payment	United States
Genesis Health Ventures, Inc.	$395.00	Missed interest payment	United States
Glenoit Corporation	$100.00	Missed interest payment	United States
Hedstrom Corporation	$110.00	Chapter 11	United States
Hedstrom Holdings, Inc.	$45.00	Chapter 11	United States
Multicare Companies, Inc.	$250.00	Missed interest payment	United States
Silver Cinemas International, Inc.	$99.58	Missed interest payment	United States
Stellex Technologies, Inc.	$100.00	Missed interest payment	United States
Uniforet, Inc.	$141.87	Missed interest payment	Canada
United Artists Theatre Company	$275.00	Missed interest payment	United States
Total (USD Millions)	$2,276.45		
Number of Defaulting Companies	15		

Exhibit 34 - Chronological List of 2000 Defaulters

Company Name	Defaulted Amount	Default Description	Legal Domain
May			
American Eco Corporation	$117.30	Missed interest payment	United States
Cambridge Industries, Inc.	$98.00	Chapter 11	United States
Canlan Ice Sports Corporation	$13.53	Missed interest payment	Canada
ContiFinancial Corporation	$700.00	Chapter 11	United States
Converse, Inc.	$74.27	Missed interest payment	United States
Decora Industries, Inc.	$112.75	Missed interest payment	United States
GST Equipment Funding, Inc.	$265.00	Chapter 11	United States
GST Network Funding, Inc.	$500.00	Chapter 11	United States
GST Telecommunications, Inc.	$125.00	Chapter 11	United States
GST USA, Inc.	$312.45	Chapter 11	United States
Kitty Hawk, Inc.	$340.00	Chapter 11	United States
Laidlaw One, Inc.	$63.02	Missed interest payment	United States
Laidlaw, Inc.	$1,999.03	Missed interest payment	Canada
Packaging Resources, Inc.	$110.00	Missed interest payment	United States
Pathmark Stores, Inc.	$958.86	Missed interest payment	United States
Saehan Media Corporation	$177.01	Suspension of payments	Korea
Safety-Kleen Corporation	$225.00	Missed interest payment	United States
Safety-Kleen Services, Inc.	$325.00	Missed interest payment	United States
Sunterra Corporation	$477.81	Missed interest payment	United States
Supermarkets General Holdings Corp.	$0.98	Missed interest payment	United States
Transtel Pass Through Trust	$150.00	Missed interest payment	Colombia
Yeungnam Merchant Banking Corporation	$4.45	Suspension of payments	Korea
Total (USD Millions)	$7,149.47		
Number of Defaulting Companies	22		
June			
American Architectural Products Corporation	$125.00	Missed interest payment	United States
Bulong Operations Pty Ltd.	$185.00	Missed interest payment	Australia
Cuddy International Corporation	$75.00	Missed interest payment	Canada
Fine Air Services, Inc.	$143.50	Missed interest payment	United States
Flooring America, Inc.	$71.00	Chapter 11	United States
Gorges/Quick-to-Fix Foods, Inc.	$52.00	Missed interest payment	United States
Greater Beijing First Expressways Limited	$288.00	Missed interest payment	Hong Kong
Hainan International Trust & Investment Corporation	$273.29	Missed interest payment	China
Iowa Select Farms, L.P.	$130.00	Missed interest payment	United States
MEDIQ, Inc.	$140.89	Missed interest payment	United States
MEDIQ/PRN Life Support Services, Inc.	$190.00	Missed interest payment	United States
Pharmaceutical Formulations, Inc.	$5.77	Missed interest payment	United States
Premier Graphics, Inc.	$128.50	Missed interest payment	United States
Saehan Industries, Inc.	$297.76	Suspension of payments	Korea
Safelite Glass Corporation	$155.00	Prepackaged Chapter 11	United States
Specialty Retailers, Inc.	$299.00	Chapter 11	United States
Waxman Industries, Inc.	$92.80	Missed interest payment	United States
Total (USD Millions)	$2,652.50		
Number of Defaulting Companies	17		
July			
Galax Energy Concepts, LLC	$4.55	Missed interest payment	United States
GNI Group, Inc.	$75.00	Missed interest payment	United States
H&S Investment Bank	$117.86	Suspension of payments	Korea
Innovative Clinical Solutions, Ltd.	$100.00	Chapter 11	United States
RBX Corporation	$200.00	Missed interest payment	United States
Southern Petrochemicals Industries Corporation Ltd.	$120.00	Missed interest payment	India
Tokheim Corporation	$254.50	Missed interest payment	United States
Zhu Hai Highway Company Limited	$196.40	Missed interest payment	Hong Kong
Total (USD Millions)	$1,068.30		
Number of Defaulting Companies	8		

Exhibit 34 - Chronological List of 2000 Defaulters

Company Name	Defaulted Amount	Default Description	Legal Domain
August			
AMF Bowling Worldwide, Inc.	$701.50	Missed interest payment	United States
AMF Bowling, Inc.	$610.71	Missed interest payment	United States
Anchor Advanced Products, Inc.	$50.00	Distressed exchange	United States
Burnham Service Corp.	$1.44	Chapter 11	United States
Carmike Cinemas, Inc.	$200.00	Suspension of payments	United States
Central European Media Enterprises Ltd.	$164.71	Missed interest payment	Bermuda
Family Care Communities of Pennsylvania, Inc.	$4.49	Missed interest payment	United States
Globe Holdings, Inc.	$49.09	Missed interest payment	United States
Globe Manufacturing Corporation	$150.00	Missed interest payment	United States
Korea Merchant Banking Corporation	$229.57	Bankruptcy	Korea
MacSaver Financial Services, Inc.	$475.00	Missed interest payment	United States
Orbcomm Global, L.P.	$170.00	Missed interest payment	United States
PhyCor, Inc.	$196.50	Grace period default	United States
Total (USD Millions)	$3,003.01		
Number of Defaulting Companies	13		
September			
Amer Reefer Co. Limited	$100.00	Missed interest payment	Cyprus
Central Banking Corporation	$180.90	Suspension of payments	Korea
Dyersburg Corporation	$125.00	Missed interest payment	United States
Galaxy Telecom L.P.	$120.00	Suspension of payments	United States
Kasper A.S.L., Ltd.	$110.00	Missed interest payment	United States
Kawaden Corporation	$50.95	Bankruptcy	Japan
Peru, Republic of	$4,870.53	Grace period default	Peru
Plainwell, Inc.	$130.00	Missed interest payment	United States
Pueblo Xtra International, Inc.	$177.28	Distressed exchange	Puerto Rico
Resort at Summerlin, Limited Partnership	$120.18	Missed interest payment	United States
SFAC New Holdings, Inc.	$569.64	Chapter 11	United States
SFC New Holdings, Inc.	$371.87	Chapter 11	United States
Total (USD Millions)	$6,926.34		
Number of Defaulting Companies	12		
October			
Anacomp Inc.	$335.00	Missed interest payment	United States
Compass Aerospace Corporation	$129.00	Grace period default	United States
Cooker Restaurant Corporation	$12.55	Missed interest payment	United States
Drypers Corp.	$145.00	Chapter 11	United States
Indesco International, Inc.	$145.00	Missed interest payment	United States
Italian-Thai Development Plc.	$81.45	Missed interest payment	Thailand
Nevada Bob's Golf, Inc.	$4.32	Bankruptcy	Canada
Owens Corning	$1,329.19	Chapter 11	United States
Total (USD Millions)	$2,181.51		
Number of Defaulting Companies	8		
November			
Big V Supermarkets, Inc.	$80.00	Suspension of payments	United States
Colorado Prime Corporation	$100.00	Missed interest payment	United States
Daewoo Motor Company Ltd.	$2,453.75	Bankruptcy	Korea
Dictaphone Corporation	$158.50	Chapter 11	United States
Dong Ah Construction Industrial Co. Ltd.	$303.41	Bankruptcy	Korea
Global Health Sciences, Inc.	$225.00	Missed interest payment	United States
Hyundai Engineering & Construction Co. Ltd.	$2,029.11	Missed principal payment	Korea
ICG Holdings, Inc.	$1,310.60	Chapter 11	United States
ICG Services, Inc.	$895.25	Chapter 11	United States
Korea Express Co. Ltd.	$46.56	Bankruptcy	Korea
Lodestar Holdings, Inc.	$150.00	Missed interest payment	United States
Metal Management, Inc.	$210.00	Missed interest payment	United States
Ntex, Inc.	$75.00	Grace period default	Canada
Pillowtex Corporation	$310.00	Chapter 11	United States
PNV, Inc.	$75.00	Missed interest payment	United States
Reliance Group Holdings, Inc.	$465.03	Missed interest payment	United States
Samsung Commercial Vehicle Company	$260.62	Liquidated	Korea
Talon Automotive Group, Inc.	$120.00	Missed interest payment	United States
Wheeling-Pittsburgh Corporation	$275.00	Missed interest payment	United States
Total (USD Millions)	$9,542.83		
Number of Defaulting Companies	19		

Exhibit 34 - Chronological List of 2000 Defaulters

Company Name	Defaulted Amount	Default Description	Legal Domain
December			
Armstrong World Industries, Inc.	$655.00	Chapter 11	United States
DGS International Finance Company B.V.	$225.00	Missed interest payment	Indonesia
El Comandante Capital Corporation	$60.84	Missed interest payment	Puerto Rico
Esprit Telecom Group Plc	$448.06	Missed interest payment	United Kingdom
Imperial Sugar Company	$270.00	Missed interest payment	United States
Kushner-Locke Company	$1.56	Missed principal and interest payments	United States
LTV Corporation	$575.00	Chapter 11	United States
Marutomi Group Co., Ltd.	$40.52	Bankruptcy	Japan
Northwestern Steel & Wire Company	$115.00	Missed interest payment	United States
Outboard Marine Corporation	$239.63	Chapter 11	United States
Panda Global Energy Company	$153.55	Distressed exchange	Cayman Islands
PCI Chemicals Canada, Inc.	$175.00	Missed interest payment	Canada
Pioneer Corporation of America	$200.00	Missed interest payment	United States
Quentra Networks, Inc.	$1.25	Chapter 11	United States
Regal Cinemas, Inc.	$800.00	Missed interest payment	United States
Tianjin International Trust & Investment Corporation	$111.29	Grace period default	China
Worldtex, Inc.	$175.00	Missed interest payment	United States
Total (USD Millions)	$4,246.70		

Exhibit 35 - Descriptive Statistics for Defaulted Bond Prices, 1970-2000

Seniority/Security	Median	Average	StDev	Minimum	Maximum	1st Quartile	3rd Quartile
Senior/ Secured Bank Loans	72.0	64.0	24.4	5.0	98.0	45.3	85.0
Senior/ Unsecured Bank Loans	45.0	49.0	28.4	5.0	88.0	25.0	75.8
Senior/ Secured Bonds	53.8	52.6	24.6	1.6	103.0	34.8	68.6
Senior/ Unsecured Bonds	44.0	46.9	28.0	0.5	122.6	25.0	66.8
Senior/ Subordinated Bonds	29.0	34.7	24.6	0.5	123.0	15.1	50.0
Subordinated Bonds	28.5	31.6	21.2	0.5	102.5	15.0	44.1
Junior/ Subordinated Bonds	15.1	22.5	18.7	1.5	74.0	11.3	33.0
Preferred Stock	11.1	18.1	17.2	0.1	86.0	6.4	24.9

Exhibit 36 - All-Corporate Average Rating Transition Matrix, 1980-2000

	Rating to:	Aaa	Aa	A	Baa	Ba	B	Caa-C	Default	WR
	Aaa	86.17%	9.45%	1.02%	0.00%	0.03%	0.00%	0.00%	0.00%	3.33%
	Aa	1.10%	86.05%	8.93%	0.31%	0.11%	0.01%	0.00%	0.03%	3.46%
Rating	A	0.06%	2.85%	86.75%	5.58%	0.66%	0.17%	0.01%	0.01%	3.91%
from:	Baa	0.06%	0.34%	6.64%	81.00%	5.52%	0.97%	0.08%	0.16%	5.23%
	Ba	0.03%	0.06%	0.54%	5.46%	75.50%	8.18%	0.53%	1.32%	8.38%
	B	0.01%	0.04%	0.20%	0.56%	5.92%	75.94%	3.03%	6.41%	7.90%
	Caa-C	0.00%	0.00%	0.00%	0.87%	2.61%	5.62%	57.02%	25.31%	8.58%

Exhibit 37 - All-Corporate Rating Transition Matrix, 2000

	Rating to:	Aaa	Aa	A	Baa	Ba	B	Caa-C	Default	WR
	Aaa	92.48%	3.01%	3.01%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%
	Aa	0.51%	90.22%	6.75%	0.00%	0.00%	0.00%	0.00%	0.00%	2.53%
Rating	A	0.00%	5.99%	85.97%	4.28%	0.34%	0.17%	0.00%	0.00%	3.25%
from:	Baa	0.09%	0.75%	8.56%	83.16%	2.16%	1.22%	0.28%	0.38%	3.39%
	Ba	0.00%	0.00%	0.85%	8.21%	77.61%	6.67%	0.51%	1.03%	5.13%
	B	0.00%	0.20%	0.69%	0.00%	2.46%	80.35%	6.09%	5.01%	5.21%
	Caa-C	0.00%	0.00%	0.00%	0.00%	0.75%	8.61%	67.79%	17.98%	4.87%

Exhibit 38 - One-Year Default Rate Descriptive Statistics, 1970-2000

	Aaa	Aa	A	Baa	Ba	B	Caa-C
Minimum	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1st Quartile	0.00%	0.00%	0.00%	0.00%	0.27%	3.83%	8.67%
Median	0.00%	0.00%	0.00%	0.00%	0.83%	5.60%	20.00%
Mean	0.00%	0.02%	0.01%	0.14%	1.20%	5.96%	24.36%
3rd Quartile	0.00%	0.00%	0.00%	0.27%	1.50%	7.04%	36.67%
Maximum	0.00%	0.61%	0.26%	1.33%	5.60%	23.08%	53.33%

Exhibit 39 - One-Year Default Rates by Year and Letter Rating, 1970-2000

Rating	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Aaa	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Aa	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.26%	0.00%	0.00%
Baa	0.27%	0.00%	0.00%	0.45%	0.00%	0.00%	0.00%	0.28%	0.00%	0.00%	0.00%	0.00%	0.31%	0.00%	0.36%
Ba	4.12%	0.42%	0.00%	0.00%	0.00%	1.02%	1.01%	0.52%	1.08%	0.49%	0.00%	0.00%	2.72%	0.91%	0.83%
B	22.78%	3.85%	7.14%	3.77%	10.00%	5.97%	0.00%	3.28%	5.41%	0.00%	4.94%	4.49%	2.41%	6.31%	6.72%
Investment-Grade	0.14%	0.00%	0.00%	0.23%	0.00%	0.00%	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.21%	0.00%	0.09%
Speculative-Grade	9.38%	1.14%	1.94%	1.28%	1.35%	1.79%	0.89%	1.35%	1.79%	0.42%	1.62%	0.71%	3.57%	3.88%	3.39%
US Only Speculative-grade	9.72	1.52	1.94	1.28	1.36	1.79	0.89	1.36	1.80	0.42	1.62	0.71	3.58	3.90	3.40
All Corporates	2.72%	0.28%	0.45%	0.45%	0.27%	0.36%	0.17%	0.35%	0.35%	0.09%	0.34%	0.16%	1.03%	0.95%	0.91%

Rating	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Aaa	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Aa	0.00%	0.00%	0.00%	0.00%	0.61%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Baa	0.00%	1.33%	0.00%	0.00%	0.60%	0.00%	0.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.12%	0.10%	0.38%
Ba	1.75%	2.04%	2.71%	1.24%	2.98%	3.34%	5.30%	0.30%	0.55%	0.24%	0.67%	0.00%	0.19%	0.61%	1.14%	1.05%
B	8.22%	11.80%	6.25%	6.04%	9.21%	16.16%	14.71%	9.03%	5.79%	3.82%	4.80%	1.44%	2.11%	4.26%	5.88%	5.14%
Investment-Grade	0.00%	0.32%	0.00%	0.00%	0.28%	0.00%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.04%	0.14%
Speculative-Grade	3.90%	5.67%	4.23%	3.47%	6.03%	9.85%	10.52%	4.86%	3.51%	1.93%	3.30%	1.65%	2.03%	3.41%	5.63%	5.71%
US Only Speculative-grade	3.99%	5.81%	4.18%	3.53%	5.76%	9.77%	10.57%	5.15%	3.84%	2.07%	3.64%	1.92%	2.16%	3.90%	5.75%	6.82%
All Corporates	1.06%	1.89%	1.49%	1.30%	2.41%	3.51%	3.28%	1.33%	0.96%	0.57%	1.06%	0.53%	0.67%	1.26%	2.20%	2.28%

Exhibit 40 - One-Year Default Rates by Year and Alpha-Numeric Rating, 1983-2000

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Aaa	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Aa1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Aa2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Aa3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
A1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
A2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
A3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Baa1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.29%
Baa2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.32%	0.00%	0.00%
Baa3	0.00%	1.06%	0.00%	4.82%	0.00%	0.00%	1.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.34%	0.98%
Ba1	0.00%	1.16%	0.00%	0.88%	3.73%	0.00%	0.79%	2.67%	1.06%	0.00%	0.81%	0.00%	0.00%	0.00%	0.00%	0.00%	0.47%	0.91%
Ba2	0.00%	1.61%	1.63%	1.20%	0.95%	0.00%	1.82%	2.82%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.61%	0.00%	0.66%
Ba3	2.61%	0.00%	3.77%	3.44%	2.95%	2.59%	4.71%	3.92%	9.89%	0.74%	0.75%	0.59%	1.72%	0.00%	0.47%	1.09%	2.27%	1.51%
B1	0.00%	5.84%	4.38%	7.61%	4.93%	4.34%	6.24%	8.59%	6.04%	1.03%	3.32%	1.90%	4.35%	1.17%	0.00%	2.13%	3.08%	3.25%
B2	10.00%	18.75%	7.41%	16.67%	4.30%	6.90%	8.28%	22.09%	12.74%	1.54%	4.96%	3.66%	6.36%	0.00%	1.50%	7.57%	6.68%	3.89%
B3	17.91%	2.90%	13.86%	16.07%	10.37%	9.72%	19.55%	28.93%	28.42%	24.54%	11.48%	8.05%	4.10%	3.36%	7.41%	5.61%	9.90%	9.92%
Investment-Grade	0.00%	0.09%	0.00%	0.32%	0.00%	0.00%	0.28%	0.00%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.04%	0.14%
Speculative-Grade	3.82%	3.32%	3.90%	5.67%	4.23%	3.47%	6.03%	9.85%	10.52%	4.86%	3.51%	1.93%	3.30%	1.65%	2.03%	3.41%	5.63%	5.71%
All Corporates	0.95%	0.91%	1.06%	1.89%	1.49%	1.30%	2.41%	3.51%	3.28%	1.33%	0.96%	0.57%	1.06%	0.53%	0.67%	1.26%	2.20%	2.28%

Exhibit 41 - Average Cumulative Default Rates by Letter Rating From 1 to 20 Years - 1970-2000

Rating	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	0.00%	0.00%	0.00%	0.04%	0.12%	0.21%	0.31%	0.42%	0.54%	0.67%	0.81%	0.98%	1.16%	1.26%	1.37%	1.50%	1.63%	1.77%	1.77%	1.77%
Aa	0.02%	0.04%	0.08%	0.20%	0.31%	0.43%	0.55%	0.67%	0.76%	0.83%	0.91%	1.03%	1.18%	1.39%	1.45%	1.52%	1.68%	1.78%	1.99%	2.24%
A	0.01%	0.05%	0.18%	0.31%	0.45%	0.61%	0.78%	0.96%	1.18%	1.43%	1.68%	1.92%	2.14%	2.35%	2.65%	2.96%	3.28%	3.64%	4.03%	4.30%
Baa	0.14%	0.44%	0.83%	1.34%	1.82%	2.33%	2.86%	3.39%	3.97%	4.56%	5.20%	5.86%	6.54%	7.25%	8.01%	8.80%	9.60%	10.30%	10.84%	11.27%
Ba	1.27%	3.57%	6.11%	8.65%	11.23%	13.50%	15.32%	17.21%	19.00%	20.76%	22.67%	24.73%	26.63%	28.25%	29.87%	31.61%	33.15%	34.49%	35.54%	36.50%
B	6.16%	12.90%	18.76%	23.50%	27.92%	31.89%	35.55%	38.69%	41.51%	44.57%	46.69%	48.19%	49.52%	51.54%	52.83%	53.88%	54.52%	54.52%	54.52%	54.52%
Investment-Grade	0.05%	0.17%	0.35%	0.59%	0.82%	1.07%	1.34%	1.61%	1.91%	2.21%	2.54%	2.88%	3.23%	3.59%	3.98%	4.39%	4.82%	5.23%	5.60%	5.90%
Speculative-Grade	4.15%	8.39%	12.19%	15.48%	18.56%	21.26%	23.48%	25.60%	27.54%	29.46%	31.32%	33.15%	34.83%	36.38%	37.83%	39.35%	40.66%	41.74%	42.61%	43.40%
All Corporates	1.30%	2.61%	3.76%	4.77%	5.67%	6.46%	7.13%	7.76%	8.37%	8.96%	9.56%	10.15%	10.72%	11.26%	11.81%	12.38%	12.94%	13.44%	13.88%	14.24%

Exhibit 42 - Average Cumulative Default Rates from 1 to 10 Years - 1983-2000

	1	2	3	4	5	6	7	8	9	10
Aaa	0.00%	0.00%	0.00%	0.06%	0.18%	0.25%	0.34%	0.43%	0.43%	0.43%
Aa1	0.00%	0.00%	0.00%	0.21%	0.21%	0.35%	0.35%	0.35%	0.35%	0.35%
Aa2	0.00%	0.00%	0.06%	0.18%	0.41%	0.49%	0.59%	0.71%	0.85%	1.01%
Aa3	0.06%	0.09%	0.17%	0.26%	0.37%	0.49%	0.49%	0.49%	0.49%	0.49%
A1	0.00%	0.03%	0.30%	0.47%	0.59%	0.73%	0.79%	0.86%	0.86%	0.96%
A2	0.00%	0.02%	0.16%	0.41%	0.62%	0.84%	0.99%	1.35%	1.63%	1.71%
A3	0.00%	0.12%	0.22%	0.30%	0.35%	0.47%	0.68%	0.77%	0.97%	1.09%
Baa1	0.07%	0.30%	0.53%	0.86%	1.19%	1.43%	1.82%	2.05%	2.20%	2.20%
Baa2	0.06%	0.29%	0.61%	1.22%	1.89%	2.54%	2.93%	3.17%	3.46%	3.81%
Baa3	0.39%	1.05%	1.62%	2.47%	3.15%	4.09%	4.99%	5.95%	6.54%	7.03%
Ba1	0.64%	2.10%	3.81%	6.15%	8.12%	10.09%	11.43%	12.75%	13.35%	14.08%
Ba2	0.54%	2.44%	4.95%	7.32%	9.27%	10.88%	12.59%	13.60%	14.27%	14.71%
Ba3	2.47%	6.82%	11.68%	16.18%	20.63%	24.74%	28.39%	32.28%	35.83%	38.22%
B1	3.48%	9.71%	15.59%	20.56%	25.62%	30.78%	36.15%	40.30%	44.16%	48.01%
B2	6.23%	13.70%	20.03%	24.63%	28.24%	31.14%	32.73%	34.33%	35.03%	35.90%
B3	11.88%	20.18%	26.71%	31.95%	36.68%	39.89%	42.81%	46.80%	51.42%	53.53%
Caa1-C	18.85%	28.29%	34.51%	40.23%	43.42%	46.48%	46.48%	49.73%	53.92%	59.04%
Investment-Grade	0.05%	0.17%	0.35%	0.60%	0.84%	1.08%	1.28%	1.47%	1.62%	1.73%
Speculative-Grade	3.69%	8.39%	12.87%	16.80%	20.39%	23.61%	26.44%	29.04%	31.22%	32.89%
All Corporates	1.21%	2.72%	4.12%	5.34%	6.39%	7.30%	8.05%	8.71%	9.23%	9.61%

Exhibit 43 - Cumulative Default Rates for Cohorts Formed Since 1970 (Percent)

Years:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
COHORT FORMED JANUARY 1, 1970																				
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.70	2.70	2.70
Aa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42	1.42	1.42	2.88	2.88	2.88	2.88
A	0.00	0.00	0.00	0.00	0.00	0.43	0.43	0.43	0.43	0.43	0.90	0.90	0.90	0.90	0.90	0.90	1.42	1.42	2.54	2.54
Baa	0.27	0.27	0.27	1.14	1.44	1.44	1.75	2.39	3.07	3.07	3.43	3.43	4.61	5.01	5.44	6.31	7.70	8.71	9.81	10.41
Ba	4.12	4.55	4.99	5.45	6.39	7.37	7.89	8.44	9.60	9.60	9.60	11.07	13.42	14.25	14.25	17.13	21.22	22.37	22.37	23.77
B	22.78	25.36	27.93	27.93	27.93	27.93	27.93	27.93	27.93	27.93	27.93	27.93	35.32	35.32	35.32	35.32	35.32	35.32	35.32	35.32
Investment-Grade	0.14	0.14	0.14	0.57	0.71	0.86	1.01	1.32	1.63	1.63	1.97	1.97	2.49	2.85	3.04	3.41	4.38	4.99	5.86	6.08%
Speculative-Grade	9.09	10.13	11.91	12.66	13.43	14.23	14.65	15.54	16.48	16.48	16.48	17.64	20.74	21.40	21.40	23.64	26.88	27.79	27.79	28.90%
All Corporates	2.72	3.02	3.52	4.04	4.35	4.68	4.90	5.35	5.82	5.82	6.08	6.34	7.42	7.84	7.99	8.73	10.11	10.77	11.47	11.83%
COHORT FORMED JANUARY 1, 1971																				
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.78	2.78	2.78	2.78%
Aa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75%
A	0.00	0.00	0.00	0.00	0.38	0.38	0.38	0.38	0.38	0.79	0.79	1.22	1.65	1.65	1.65	2.09	2.09	3.06	3.06	3.06%
Baa	0.00	0.00	0.80	1.07	1.07	1.36	1.96	2.59	2.59	2.93	2.93	4.04	4.43	4.83	5.65	6.96	7.91	8.93	9.48	10.64%
Ba	0.42	0.86	1.31	2.24	3.70	4.21	4.75	5.91	5.91	5.91	7.34	9.64	10.45	10.45	13.24	18.22	19.36	19.36	20.74	20.74%
B	3.85	7.69	7.69	7.69	7.69	7.69	7.69	7.69	7.69	7.69	7.69	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00%
Investment-Grade	0.00	0.00	0.39	0.53	0.67	0.81	1.09	1.38	1.38	1.69	1.69	2.35	2.69	2.86	3.21	3.93	4.50	5.30	5.51	6.16%
Speculative-Grade	1.10	3.01	3.80	4.62	5.91	6.36	7.31	8.32	8.32	8.32	9.57	12.90	13.60	13.60	16.00	20.31	21.28	21.28	22.48	22.48%
All Corporates	0.28	0.77	1.26	1.56	1.98	2.19	2.63	3.08	3.08	3.33	3.58	4.76	5.17	5.31	6.02	7.36	7.99	8.66	9.01	9.56%

Exhibit 43 - Cumulative Default Rates for Cohorts Formed Since 1970 (Percent) (Cont'd)

Years:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
COHORT FORMED JANUARY 1, 1972																				
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.70	2.70	2.70	2.70	2.70%
Aa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	1.67%
A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.78	0.78	0.78	1.19	1.19	2.08	2.08	2.57	3.07%
Baa	0.00	0.73	0.98	1.24	1.50	2.06	2.63	2.63	3.26	3.26	3.96	4.31	4.68	5.45	6.66	7.53	8.48	9.49	11.11	13.36%
Ba	0.00	0.45	1.37	2.80	3.31	3.84	4.96	4.96	4.96	6.34	9.28	10.06	10.89	14.40	19.11	20.16	20.16	21.42	22.74	29.64%
B	7.14	7.14	7.14	7.14	7.14	7.14	7.14	7.14	7.14	7.14	18.07	18.07	18.07	18.07	18.07	18.07	18.07	18.07	18.07	18.07%
Investment-Grade	0.00	0.37	0.49	0.62	0.74	1.01	1.28	1.28	1.57	1.57	2.03	2.34	2.50	2.82	3.49	4.02	4.77	5.16	6.18	7.22%
Speculative-Grade	1.88	2.65	3.46	4.71	5.15	6.08	7.06	7.06	7.06	8.24	12.02	12.70	13.41	16.45	20.53	21.44	21.44	22.53	23.71	29.86%
All Corporates	0.45	0.92	1.20	1.59	1.79	2.20	2.62	2.62	2.85	3.09	4.19	4.57	4.83	5.63	6.88	7.46	8.09	8.58	9.61	11.38%
COHORT FORMED JANUARY 1, 1973																				
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.70	2.70	2.70	2.70	2.70	2.70%
Aa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.56	1.56	1.56%
A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.76	0.76	0.76	1.16	1.16	2.03	2.03	2.50	2.99	3.51%
Baa	0.45	0.69	1.16	1.41	1.92	2.46	2.46	3.04	3.04	3.69	4.35	5.04	6.11	7.23	8.03	8.91	9.85	11.85	13.97	13.97%
Ba	0.00	0.97	1.99	2.52	3.09	4.27	4.27	4.27	5.70	9.49	10.29	10.29	12.94	17.70	19.85	19.85	21.11	22.44	30.67	32.15%
B	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	3.77	15.09	15.09	15.09	15.09	15.09	15.09	15.09	15.09	15.09	15.09	15.09%
Investment-Grade	0.23	0.35	0.59	0.71	0.96	1.22	1.22	1.49	1.49	1.93	2.37	2.67	3.14	3.78	4.28	4.99	5.37	6.53	7.53	7.74%
Speculative-Grade	1.24	2.09	2.98	3.45	4.44	5.48	5.48	5.48	6.72	11.30	11.99	11.99	14.33	18.53	20.41	20.41	21.54	22.75	30.28	31.62%
All Corporates	0.45	0.73	1.11	1.30	1.70	2.11	2.11	2.33	2.56	3.75	4.24	4.49	5.26	6.46	7.17	7.78	8.25	9.41	11.30	11.66%

Exhibit 43 - Cumulative Default Rates for Cohorts Formed Since 1970 (Percent) (Cont'd)

Years:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
COHORT FORMED JANUARY 1, 1974																				
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.44	2.44	2.44	2.44	2.44	2.44	2.44%
Aa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	2.74	2.74	2.74	2.74%
A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.76	0.76	0.76	1.16	1.16	2.02	2.02	2.48	2.96	3.47	3.47%
Baa	0.00	0.47	0.72	1.22	1.75	1.75	2.33	2.33	2.97	3.63	4.31	5.37	5.74	6.54	7.42	8.35	9.85	11.94	11.94	11.94%
Ba	0.00	1.06	1.62	2.22	3.47	3.47	3.47	4.22	8.18	9.01	9.01	11.75	18.62	20.83	20.83	22.14	24.87	33.30	34.81	36.53%
B	10.00	10.00	10.00	10.00	10.00	10.00	10.00	14.39	23.65	23.65	23.65	23.65	23.65	23.65	23.65	23.65	23.65	23.65	23.65	23.65%
Investment-Grade	0.00	0.24	0.36	0.60	0.85	0.85	1.12	1.12	1.69	2.13	2.43	2.88	3.20	3.69	4.39	4.75	5.70	6.68	6.89	6.89%
Speculative-Grade	1.31	2.22	2.70	3.72	4.78	4.78	4.78	6.05	10.73	11.45	11.45	13.84	19.84	21.76	21.76	22.92	25.41	33.19	34.58	36.14%
All Corporates	0.27	0.65	0.84	1.24	1.64	1.64	1.86	2.09	3.38	3.87	4.11	4.88	6.07	6.77	7.36	7.83	8.98	10.83	11.19	11.39%
COHORT FORMED JANUARY 1, 1975																				
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.96	1.96	1.96	1.96	1.96	1.96	1.96	1.96%
Aa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	1.04	1.04	1.04	1.04	1.04	2.23	2.23	3.47	3.47	3.47	3.47	3.47%
A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.37	0.37	0.75	0.75	1.59	1.59	2.04	2.97	3.47	4.01	4.01%
Baa	0.00	0.00	0.26	0.79	0.79	1.37	1.37	2.33	2.99	3.67	4.73	5.10	5.90	6.33	7.26	9.22	11.27	11.27	11.27	11.27%
Ba	1.02	2.10	3.23	3.83	3.83	3.83	4.54	8.35	9.14	9.14	11.77	18.34	20.46	21.63	22.88	24.19	30.90	32.34	33.93	33.93%
B	5.97	5.97	5.97	9.27	9.27	9.27	13.13	21.21	21.21	21.21	21.21	21.21	21.21	21.21	21.21	31.06	42.55	42.55	42.55	42.55%
Investment-Grade	0.00	0.00	0.12	0.36	0.36	0.62	0.62	1.16	1.58	1.86	2.29	2.59	3.06	3.72	4.06	5.14	6.24	6.43	6.65	6.65%
Speculative-Grade	1.73	2.64	4.07	5.07	5.07	5.07	6.26	10.70	11.37	11.37	13.63	19.31	21.12	22.11	23.19	25.48	32.64	33.91	35.30	35.30%
All Corporates	0.36	0.54	0.92	1.31	1.31	1.52	1.74	2.97	3.43	3.66	4.39	5.51	6.18	6.88	7.32	8.55	10.45	10.78	11.15	11.15%

Exhibit 43 - Cumulative Default Rates for Cohorts Formed Since 1970 (Percent) (Cont'd)

Years:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
COHORT FORMED JANUARY 1, 1976																				
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59%
Aa	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.97	0.97	0.97	0.97	0.97	2.09	2.09	3.26	3.26	3.26	3.26	3.26	3.26%
A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.64	0.64	1.31	1.31	2.43	2.43	2.83	4.08	4.08	4.57	4.57	5.62%
Baa	0.00	0.27	0.56	0.56	0.87	0.87	2.22	2.92	3.64	4.76	5.15	5.99	5.99	6.97	9.06	10.69	11.25	11.25	11.25	11.25%
Ba	1.01	2.07	3.19	3.19	3.81	4.47	7.31	8.05	8.05	10.49	16.57	18.54	19.63	20.79	21.99	29.48	30.82	32.29	32.29	32.29%
B	0.00	0.00	3.64	3.64	3.64	8.12	17.54	17.54	17.54	17.54	17.54	17.54	17.54	17.54	30.23	45.73	45.73	45.73	45.73	45.73%
Investment-Grade	0.00	0.11	0.23	0.23	0.35	0.35	0.98	1.50	1.77	2.18	2.60	3.04	3.67	3.99	5.01	6.05	6.24	6.44	6.44	6.88%
Speculative-Grade	0.87	2.25	3.68	3.68	4.22	5.37	9.02	9.67	9.67	11.84	17.28	19.02	19.98	21.02	23.20	31.22	32.46	33.81	33.81	33.81%
All Corporates	0.17	0.53	0.90	0.90	1.10	1.30	2.46	3.00	3.22	3.91	5.10	5.73	6.40	6.82	7.98	9.93	10.25	10.60	10.60	10.98%
COHORT FORMED JANUARY 1, 1977																				
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Aa	0.00	0.00	0.00	0.00	0.00	0.90	0.90	0.90	0.90	0.90	0.90	1.96	1.96	3.05	3.05	3.05	3.05	3.05	3.05	3.05
A	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.60	0.60	1.24	1.24	3.01	3.01	3.77	4.96	4.96	5.43	5.43	6.43	6.43
Baa	0.28	0.57	0.57	0.57	0.57	1.93	2.64	3.36	4.50	4.90	5.74	5.74	6.73	8.31	9.94	10.51	10.51	10.51	10.51	10.51
Ba	0.52	1.62	1.62	2.23	2.88	5.63	6.36	6.36	8.73	14.62	16.50	17.54	18.64	19.79	27.03	28.33	29.77	29.77	29.77	29.77
B	3.28	6.73	6.73	10.97	15.54	25.78	25.78	25.78	25.78	25.78	25.78	25.78	25.78	39.27	56.62	56.62	56.62	56.62	56.62	56.62
Investment-Grade	0.11	0.22	0.22	0.22	0.22	0.84	1.34	1.60	2.00	2.41	2.84	3.75	4.07	5.05	6.07	6.25	6.44	6.44	6.88	6.88
Speculative-Grade	1.34	2.75	2.75	3.80	4.93	8.52	9.16	9.16	11.29	16.60	18.29	19.22	20.21	22.31	30.08	31.29	32.61	32.61	32.61	32.61
All Corporates	0.35	0.71	0.71	0.90	1.10	2.22	2.75	2.97	3.64	4.80	5.41	6.32	6.73	7.86	9.75	10.06	10.40	10.40	10.78	10.78

Exhibit 43 - Cumulative Default Rates for Cohorts Formed Since 1970 (Percent) (Cont'd)

Years:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
COHORT FORMED JANUARY 1, 1978																				
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	1.39	1.39	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
Aa	0.00	0.00	0.00	0.00	0.82	0.82	0.82	0.82	0.82	0.82	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74
A	0.00	0.00	0.00	0.00	0.00	0.61	0.61	0.61	1.27	1.27	2.73	2.73	3.92	4.74	4.74	5.23	5.23	6.27	6.27	6.27
Baa	0.00	0.00	0.00	0.00	1.32	1.67	2.38	3.49	3.87	4.70	5.14	6.09	7.60	9.70	10.24	10.24	10.24	10.24	10.24	10.24
Ba	1.08	1.08	1.08	1.74	4.50	5.96	5.96	9.12	14.95	16.81	17.84	18.94	21.24	28.45	29.75	32.62	32.62	32.62	32.62	32.62
B	5.41	5.41	11.71	15.04	22.27	22.27	26.72	26.72	32.35	38.50	38.50	38.50	47.29	60.47	60.47	60.47	60.47	60.47	60.47	60.47
Investment-Grade	0.00	0.00	0.00	0.00	0.60	0.97	1.22	1.61	2.01	2.43	3.31	3.62	4.73	5.72	5.89	6.08	6.08	6.50	6.50	6.50
Speculative-Grade	1.78	1.78	2.78	3.86	7.28	8.49	9.13	11.80	18.21	20.58	21.44	22.37	25.34	32.75	33.91	36.46	36.46	36.46	36.46	36.46
All Corporates	0.35	0.35	0.54	0.73	1.82	2.33	2.64	3.40	4.75	5.46	6.34	6.73	8.09	9.93	10.23	10.72	10.72	11.08	11.08	11.08
COHORT FORMED JANUARY 1, 1979																				
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	1.30	1.30	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61
Aa	0.00	0.00	0.00	0.80	0.80	0.80	0.80	0.80	0.80	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71
A	0.00	0.00	0.00	0.00	0.60	0.60	0.60	1.25	1.25	2.69	2.69	3.47	4.27	4.27	4.75	4.75	5.77	5.77	5.77	5.77
Baa	0.00	0.30	0.30	1.60	1.94	2.29	3.38	3.38	4.19	4.63	5.58	8.11	10.22	10.77	10.77	10.77	10.77	10.77	10.77	10.77
Ba	0.49	0.49	1.05	3.39	5.84	9.09	11.79	18.19	19.75	20.61	21.52	24.41	31.56	32.65	35.02	35.02	35.02	35.02	35.02	35.02
B	0.00	6.45	9.85	17.21	17.21	21.69	26.58	38.33	45.18	45.18	45.18	56.14	56.14	56.14	-	-	-	-	-	-
Investment-Grade	0.00	0.11	0.11	0.70	1.06	1.18	1.56	1.82	2.22	3.09	3.39	4.63	5.60	5.77	5.95	5.95	6.37	6.37	6.37	6.37
Speculative-Grade	0.42	1.30	2.25	5.23	7.33	10.69	13.62	21.10	23.16	23.91	24.72	28.16	34.69	35.71	37.93	37.93	37.93	37.93	37.93	37.93
All Corporates	0.09	0.35	0.54	1.58	2.26	2.96	3.79	5.30	5.98	6.82	7.20	8.77	10.54	10.83	11.30	11.30	11.65	11.65	11.65	11.65

Exhibit 43 - Cumulative Default Rates for Cohorts Formed Since 1970 (Percent) (Cont'd)

Years:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
COHORT FORMED JANUARY 1, 1980																				
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.14	1.14	1.14	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31
Aa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83
A	0.00	0.00	0.28	0.86	0.86	0.86	1.78	2.11	3.14	3.14	3.89	4.66	4.66	5.12	5.12	6.10	6.10	6.10	6.10	6.64
Baa	0.00	0.00	0.96	1.29	1.63	3.05	3.05	3.45	4.29	5.65	8.05	10.05	11.10	11.10	11.10	11.10	11.10	11.10	11.10	11.10
Ba	0.00	0.53	3.83	4.99	8.64	11.81	17.85	20.05	20.86	23.55	26.38	34.50	36.74	39.15	39.15	39.15	39.15	40.55	40.55	40.55
B	4.94	7.54	15.82	21.73	28.12	31.63	44.06	48.72	48.72	48.72	60.11	68.09	68.09	68.09	68.09	68.09	68.09	68.09	68.09	68.09
Investment-Grade	0.00	0.00	0.45	0.80	0.91	1.40	1.77	2.30	3.13	3.56	4.75	5.67	6.00	6.18	6.18	6.58	6.58	6.58	6.58	6.80
Speculative-Grade	1.61	2.46	6.49	8.37	12.36	15.50	22.78	25.23	25.91	28.12	32.05	39.84	41.78	43.88	43.88	43.88	43.88	45.08	45.08	45.08
All Corporates	0.34	0.51	1.68	2.33	3.19	4.17	5.81	6.67	7.47	8.18	9.80	11.74	12.29	12.74	12.74	13.08	13.08	13.25	13.25	13.44
COHORT FORMED JANUARY 1, 1981																				
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	1.14	1.14	1.14	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32	
Aa	0.00	0.00	0.00	0.00	0.00	0.00	0.84	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	2.52	
A	0.00	0.27	0.27	0.27	0.27	1.19	1.51	2.20	2.20	2.94	3.71	3.71	4.18	4.18	5.17	5.17	5.17	5.17	5.71	
Baa	0.00	0.61	1.88	2.55	3.58	3.58	3.96	4.77	6.08	8.39	9.81	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	
Ba	0.00	3.59	5.00	7.98	12.14	18.81	20.66	21.35	24.36	28.38	36.44	38.47	40.67	40.67	40.67	40.67	41.98	43.32	43.32	
B	4.49	11.57	16.55	24.50	27.35	40.26	40.26	40.26	40.26	50.22	56.44	56.44	56.44	56.44	56.44	56.44	56.44	56.44	56.44	
Investment-Grade		0.00	0.32	0.77	0.99	1.35	1.71	2.22	3.03	3.45	4.60	5.35	5.67	5.84	5.84	6.23	6.23	6.23	6.23	6.44
Speculative-Grade		0.70	4.75	6.69	10.38	14.25	22.11	24.14	24.71	27.18	31.88	39.44	41.17	43.06	43.06	43.06	43.06	44.16	45.30	45.30
All Corporates		0.16	1.33	2.10	3.08	4.19	6.11	6.92	7.68	8.47	10.24	12.09	12.62	13.05	13.05	13.36	13.36	13.53	13.71	13.89

Exhibit 43 - Cumulative Default Rates for Cohorts Formed Since 1970 (Percent) (Cont'd)

Years:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
COHORT FORMED JANUARY 1, 1992																				
Aaa	0.00	0.00	0.00	0.00	0.00	1.13	1.13	1.13	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31		
Aa	0.00	0.00	0.00	0.00	0.00	0.75	2.28	2.28	2.28	2.28	2.28	2.28	2.28	3.37	3.37	3.37	3.37	3.37		
A	0.26	0.26	0.26	0.26	1.14	1.14	1.81	1.81	2.89	3.65	3.65	4.10	4.10	4.10	4.10	4.10	4.10	4.62		
Baa	0.31	0.31	1.32	2.37	2.74	3.52	4.36	5.70	8.05	9.51	10.52	10.52	10.52	11.14	11.14	11.14	11.14	11.14		
Ba	2.72	5.20	7.83	11.94	18.75	20.36	20.95	23.59	27.91	32.80	34.67	36.68	36.68	36.68	36.68	37.97	39.35	39.35		
B	2.41	9.92	15.14	17.92	30.31	30.31	30.31	30.31	35.67	60.18	60.18	60.18	60.18	60.18	60.18	60.18	60.18	60.18		
Investment-Grade	0.21	0.21	0.54	0.88	1.35	1.85	2.64	3.05	4.34	5.08	5.39	5.56	5.56	5.94	5.94	5.94	5.94	6.15		
Speculative-Grade	3.54	7.63	10.52	14.29	21.95	23.72	24.22	26.41	30.65	37.52	39.09	40.79	40.79	40.79	40.79	41.87	43.01	43.01		
All Corporates	1.02	2.00	2.93	4.07	6.17	6.94	7.67	8.43	10.26	12.05	12.57	12.99	12.99	13.30	13.30	13.46	13.64	13.81		
COHORT FORMED JANUARY 1, 1983																				
Aaa	0.00	0.00	0.00	0.00	2.06	2.06	2.06	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20			
Aa	0.00	0.00	0.00	0.00	0.49	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.71	2.71	2.71	2.71	2.71			
A	0.00	0.00	0.00	0.26	0.26	0.83	0.83	1.76	2.73	3.42	3.79	3.79	3.79	3.79	3.79	3.79	3.79			
Baa	0.00	1.16	1.57	3.28	3.75	4.27	5.37	6.53	7.74	7.74	7.74	7.74	7.74	7.74	7.74	7.74	8.68			
Ba	0.91	2.39	5.58	13.22	14.59	17.74	21.36	26.46	32.08	32.08	33.51	33.51	35.09	35.09	36.92	38.80	38.80			
B	6.31	11.01	17.86	25.14	28.42	29.60	32.33	40.29	50.25	55.22	58.02	58.02	58.02	58.02	58.02	58.02	58.02			
Investment-Grade	0.00	0.30	0.40	0.94	1.39	2.11	2.36	3.14	3.82	4.09	4.26	4.26	4.42	4.42	4.42	4.42	4.62			
Speculative-Grade	3.82	6.97	11.32	18.64	21.09	23.40	26.58	32.63	39.54	41.15	42.94	42.94	43.95	43.95	45.11	46.35	46.35			
All Corporates	0.95	1.93	3.02	5.08	5.96	7.00	7.80	9.49	11.15	11.62	12.02	12.02	12.31	12.31	12.47	12.63	12.79			

Exhibit 43 - Cumulative Default Rates for Cohorts Formed Since 1970 (Percent) (Cont'd)

Years:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
COHORT FORMED JANUARY 1, 1984																				
Aaa	0.00	0.00	0.00	1.21	1.21	1.21	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57	2.57				
Aa	0.00	0.00	0.00	0.89	1.82	1.82	1.82	1.82	1.82	1.82	1.82	2.46	2.46	2.46	2.46	2.46				
A	0.00	0.22	0.46	0.70	1.47	1.74	2.58	3.46	4.07	4.07	4.07	4.07	4.07	4.07	4.07	4.07				
Baa	0.36	0.36	0.77	1.23	1.74	2.81	3.94	5.73	5.73	6.43	6.43	6.43	6.43	6.43	6.43	7.35				
Ba	0.83	4.38	13.05	14.68	18.42	22.66	27.39	34.27	35.23	36.31	36.31	37.54	37.54	39.01	39.01	39.01				
B	6.72	12.77	20.11	23.99	27.13	32.07	42.30	49.51	51.76	56.83	56.83	56.83	56.83	56.83	60.94	60.94				
Investment-Grade	0.09	0.19	0.39	0.93	1.61	1.97	2.71	3.48	3.76	3.91	3.91	4.08	4.08	4.08	4.08	4.27				
Speculative-Grade	3.32	7.69	15.87	18.30	21.81	26.29	32.92	39.83	41.16	43.40	43.40	44.24	44.24	45.26	46.37	46.37				
All Corporates	0.91	2.07	4.20	5.18	6.49	7.69	9.56	11.42	11.87	12.36	12.36	12.63	12.63	12.78	12.93	13.09				
COHORT FORMED JANUARY 1, 1985																				
Aaa	0.00	0.00	0.00	0.00	0.00	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38					
Aa	0.00	0.00	0.00	0.79	0.79	0.79	0.79	0.79	0.79	0.79	1.39	1.39	1.39	1.39	1.39					
A	0.00	0.21	1.32	2.27	2.52	3.56	4.38	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.64					
Baa	0.00	1.20	1.20	1.71	2.79	3.35	5.13	5.77	6.47	6.47	6.47	6.47	6.47	6.47	8.47					
Ba	1.75	7.05	9.64	12.62	18.72	23.71	30.55	32.06	32.90	32.90	34.84	34.84	35.97	35.97	35.97					
B	8.22	17.65	23.84	27.26	31.51	43.36	50.12	52.39	57.68	57.68	57.68	57.68	57.68	61.91	61.91					
Investment-Grade	0.00	0.36	0.85	1.59	1.92	2.61	3.34	3.60	3.74	3.74	3.90	3.90	3.90	3.90	4.24					
Speculative-Grade	3.90	10.55	14.41	17.84	23.25	30.32	36.98	38.62	40.46	40.46	42.59	42.59	43.41	44.32	44.32					
All Corporates	1.06	3.10	4.46	5.87	7.38	9.43	11.32	11.84	12.29	12.29	12.81	12.81	12.94	13.09	13.38					

Exhibit 43 - Cumulative Default Rates for Cohorts Formed Since 1970 (Percent) (Cont'd)

Years:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
COHORT FORMED JANUARY 1, 1986														
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aa	0.00	0.00	0.79	0.79	1.23	1.23	1.23	1.23	1.23	1.82	1.82	1.82	1.82	1.82
A	0.00	0.19	0.79	1.20	1.86	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31
Baa	1.33	1.33	3.01	3.89	5.27	6.72	7.77	8.36	8.36	8.36	8.36	8.36	8.36	10.04
Ba	2.04	6.27	8.50	13.97	20.13	28.14	29.99	32.76	33.51	34.31	34.31	36.22	36.22	36.22
B	11.80	17.20	21.22	25.28	35.11	44.73	49.21	52.71	52.71	55.14	55.14	55.14	58.34	62.13
Investment-Grade	0.32	0.40	1.22	1.60	2.30	2.82	3.04	3.16	3.16	3.30	3.30	3.30	3.30	3.62
Speculative-Grade	5.67	10.25	13.31	18.23	25.45	33.77	36.32	39.22	39.76	41.51	41.51	42.88	43.64	44.49
All Corporates	1.89	3.27	4.71	6.25	8.49	10.72	11.41	12.08	12.18	12.62	12.62	12.86	12.98	13.37
COHORT FORMED JANUARY 1, 1987														
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Aa	0.00	0.00	0.00	0.39	0.39	0.39	0.39	0.39	0.93	0.93	0.93	0.93	0.93	
A	0.00	0.00	0.41	1.25	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	
Baa	0.00	1.04	1.78	3.33	4.96	6.26	7.21	7.21	7.21	7.21	7.85	7.85	9.24	
Ba	2.71	4.47	9.54	15.93	23.66	27.09	30.58	31.70	32.93	33.63	35.21	36.10	36.10	
B	6.25	13.11	20.01	31.60	42.88	46.34	48.41	48.41	49.78	49.78	49.78	51.75	53.95	
Investment-Grade	0.00	0.25	0.59	1.39	1.95	2.25	2.47	2.47	2.59	2.59	2.72	2.72	3.01	
Speculative-Grade	4.23	7.99	13.63	21.75	30.55	33.93	36.89	37.64	39.30	39.76	40.81	42.00	42.66	
All Corporates	1.49	2.93	5.00	8.02	10.85	11.93	12.81	12.98	13.44	13.54	13.85	14.06	14.39	

Exhibit 43 - Cumulative Default Rates for Cohorts Formed Since 1970 (Percent) (Cont'd)

Years:	1	2	3	4	5	6	7	8	9	10	11	12	13	14
COHORT FORMED JANUARY 1, 1988														
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Aa	0.00	0.33	0.67	0.67	0.67	0.67	0.67	1.14	1.14	1.14	1.14	1.14		
A	0.00	0.39	0.99	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40		
Baa	0.00	0.33	1.03	2.48	3.64	4.48	4.48	4.48	4.48	5.05	5.05	5.66		
Ba	1.24	6.98	12.83	20.59	23.63	26.83	27.75	28.75	29.87	31.14	31.85	33.42		
B	6.04	13.11	25.75	37.02	41.20	46.32	47.18	50.23	50.23	51.50	57.47	57.47		
Investment-Grade	0.00	0.31	0.81	1.32	1.59	1.79	1.79	1.90	1.90	2.02	2.02	2.14		
Speculative-Grade	3.47	9.65	18.01	26.96	30.37	34.18	35.06	37.03	37.77	39.01	41.36	42.39		
All Corporates	1.31	3.75	6.96	10.18	11.37	12.56	12.79	13.36	13.53	13.90	14.33	14.62		
Cohort formed January 1, 1989														
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Aa	0.61	0.61	0.61	0.61	0.61	0.61	1.05	1.05	1.05	1.05	1.05			
A	0.00	0.18	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56			
Baa	0.60	1.23	1.88	2.92	2.92	2.92	2.92	2.92	3.39	3.40	3.91			
Ba	2.98	10.00	18.14	20.84	24.02	24.43	25.36	26.90	28.64	30.61	32.07			
B	9.21	23.05	33.52	38.60	44.25	46.31	50.31	50.31	52.47	56.43	56.43			
Investment-Grade	0.29	0.51	0.82	1.06	1.06	1.06	1.17	1.17	1.28	1.28	1.40			
Speculative-Grade	6.02	15.85	24.94	28.52	32.57	33.58	35.57	36.53	38.35	40.97	41.91			
All Corporates	2.42	6.06	9.29	10.57	11.76	12.03	12.62	12.85	13.31	13.82	14.08			

Exhibit 43 - Cumulative Default Rates for Cohorts Formed Since 1970 (Percent) (Cont'd)

Years:	1	2	3	4	5	6	7	8	9	
COHORT FORMED JANUARY 1, 1990										
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aa	0.00	0.00	0.00	0.00	0.00	0.36	0.36	0.36	0.36	0.36
A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Baa	0.00	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	1.14
Ba	3.34	11.77	14.30	17.25	18.00	19.26	20.17	22.24	23.92	25.16
B	16.16	27.88	34.84	39.98	41.67	44.37	45.17	47.13	50.86	52.37
Investment-Grade	0.00	0.14	0.14	0.14	0.14	0.23	0.23	0.23	0.23	0.34
Speculative-Grade	9.84	19.65	24.00	27.77	28.88	30.90	31.74	33.64	35.84	37.08
All Corporates	3.51	6.891	8.26	9.38	9.69	10.29	10.50	10.95	11.42	11.74
COHORT FORMED JANUARY 1, 1991										
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Aa	0.00	0.00	0.00	0.00	0.31	0.31	0.31	0.31	0.31	
A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Baa	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.70	
Ba	5.30	6.56	8.37	8.78	10.18	11.19	12.80	14.74	16.85	
B	14.71	23.93	30.86	33.09	36.39	37.17	39.94	43.39	44.74	
Investment-Grade	0.06	0.06	0.06	0.07	0.15	0.15	0.15	0.15	0.25	
Speculative-Grade	10.52	15.21	19.14	20.29	22.66	23.53	25.52	27.82	29.56	
All Corporates	3.28	4.65	5.73	6.03	6.67	6.87	7.30	7.75	8.14	

Years:	1	2	3	4	5	6
COHORT FORMED JANUARY 1, 1994						
Aaa	0.00	0.00	0.00	0.00	0.00	0.00
Aa	0.00	0.00	0.00	0.00	0.00	0.00
A	0.00	0.00	0.00	0.00	0.00	0.00
Baa	0.00	0.21	0.21	0.43	0.66	1.87
Ba	0.24	1.77	2.05	2.97	4.73	7.05
B	3.82	9.17	12.36	14.21	18.29	23.20
Investment-Grade	0.00	0.06	0.06	0.12	0.18	0.51
Speculative-Grade	1.93	5.34	7.21	8.46	10.95	14.29
All Corporates	0.57	1.58	2.09	2.46	3.09	4.06
COHORT FORMED JANUARY 1, 1995						
Aaa	0.00	0.00	0.00	0.00	0.00	
Aa	0.00	0.00	0.00	0.00	0.00	
A	0.00	0.00	0.00	0.00	0.00	
Baa	0.00	0.00	0.00	0.43	1.54	
Ba	0.67	0.92	2.00	3.81	6.49	
B	4.8	7.32	10.18	13.89	17.85	
Investment-Grade	0.00	0.00	0.00	0.11	0.41	
Speculative-Grade	3.30	5.04	6.88	9.73	13.16	
All Corporates	1.06	1.612	2.15	3.01	4.09	

Exhibit 43 - Cumulative Default Rates for Cohorts Formed Since 1970 (Percent) (Cont'd)

Years:	1	2	3	4	5	6	7	8	9
COHORT FORMED JANUARY 1, 1992									
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Aa	0.00	0.00	0.00	0.28	0.28	0.28	0.28	0.28	
A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Baa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	
Ba	0.30	1.01	1.00	2.35	2.84	3.4	5.77	7.14	
B	9.03	17.54	20.90	24.90	27.21	29.91	33.17	35.67	
Investment-Grade	0.00	0.00	0.00	0.08	0.08	0.08	0.08	0.17	
Speculative-Grade	4.86	8.96	10.32	12.92	14.07	16.02	18..26	19.96	
All Corporates	1.33	2.38	2.72	3.37	3.62	4.01	4.43	4.79	
COHORT FORMED JANUARY 1, 1993									
Aaa	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Aa	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
A	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Baa	0.00	0.00	0.26	0.26	0.26	0.55	1.16		
Ba	0.55	0.55	2.95	3.71	4.97	6.40	7.46		
B	5.79	10.02	14.90	16.77	19.69	22.32	27.30		
Investment-Grade	0.00	0.00	0.07	0.07	0.07	0.14	0.30		
Speculative-Grade	3.51	5.14	8.81	10.18	11.95	13.79	16.04		
All Corporates	0.96	1.38	2.34	2.65	3.05	3.47	4.03		

Years:	1	2	3	4	5	6
COHORT FORMED JANUARY 1, 1996						
Aaa	0.00	0.00	0.00	0.00	0.00	
Aa	0.00	0.00	0.00	0.00	0.00	
A	0.00	0.00	0.00	0.00	0.12	
Baa	0.00	0.00	0.18	0.72	1.29	
Ba	0.00	0.70	2.27	5.42	7.56	
B	1.44	4.45	9.53	12.99	18.24	
Investment-Grade	0.00	0.0	0.05	0.20	0.42	
Speculative-Grade	1.65	3.8	7.38	11.30	14.82	
All Corporates	0.53	1.2	2.26	3.42	4.48	
COHORT FORMED JANUARY 1, 1997						
Aaa	0.00	0.00	0.00	0.00		
Aa	0.00	0.00	0.00	0.00		
A	0.00	0.00	0.00	0.11		
Baa	0.00	0.14	0.74	1.36		
Ba	0.19	1.44	5.13	7.85		
B	2.11	7.60	12.07	17.74		
Investment-Grade	0.00	0.04	0.22	0.45		
Speculative-Grade	2.03	6.02	10.42	14.63		
All Corporates	0.67	1.95	3.37	4.72		

Exhibit 43 - Cumulative Default Rates for Cohorts Formed Since 1970 (Percent) (Cont'd)

Years:	1	2	3	4	5	6	7	8	9
COHORT FORMED JANUARY 1, 1998									
Aaa	0.00	0.00	0.00						
Aa	0.00	0.00	0.00						
A	0.00	0.00	0.10						
Baa	0.12	0.61	1.12						
Ba	0.61	3.10	5.95						
B	4.26	11.48	18.59						
Investment-Grade	0.04	0.20	0.40						
Speculative-Grade	3.41	9.04	14.2						
All Corporates	1.26	3.32	5.20						
COHORT FORMED JANUARY 1, 2000									
Aaa	0.00								
Aa	0.00								
A	0.00								
Baa	0.38								
Ba	1.05								
B	5.14								
Investment-Grade	0.14								
Speculative-Grade	5.71								
All Corporates	2.28								

Years:	1	2	3	4	5	6
COHORT FORMED JANUARY 1, 1999						
Aaa	0.00	0.00				
Aa	0.00	0.00				
A	0.00	0.00				
Baa	0.10	0.75				
Ba	1.14	3.12				
B	5.88	14.32				
Investment-Grade	0.04	0.26				
Speculative-Grade	5.63	11.58				
All Corporates	2.20	4.60				

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