RETURN PERFORMANCE OF INVESTMENT-GRADE BONDS AFTER DISTRESS: AN UPDATE

Lev Dynkin, Jordan I. Mann, and Bruce D. Phelps, CFA

1. Introduction

The conclusion from our August 2002 study[1] on the return performance of distressed investment-grade bonds was that distressed investment grade bonds have performed well, as a group, versus Treasuries and other corporate issues subsequent to their distress month.[2] However, this outperformance takes time: over a year. Subsequent to the publication of the study, the credit market continued to experience difficulty. The number of distressed bonds grew rapidly. For example, our original dataset of distressed investment-grade issues from January 1990 through May 2002 stood at 377. By October 2002, it had grown to 575! On a more positive note, the credit markets seem to have stabilized recently.

Several clients have asked us to update the results of the earlier study to see how well its conclusion has held up in light of the additional market data. As we show, the conclusion of the original study remains intact. In addition, the performance of the large crop of 2001 and 2002 distressed investment-grade issues has improved significantly since our initial results and is becoming more similar to the performance of distressed issues from earlier vintages.[3]

This update also allows us to refine further our original sample set. When calculating returns for a bond that eventually defaults, we assign a price of zero at the end of its default month. For the original study, we assumed that bonds in a Lehman index were not in default and were priced using the non-zero trader-supplied price. We only examined bonds that left the Lehman Family of Indices to see if they defaulted and then assigned a default price of zero. However, we now know that prior to July 2000 some defaulted bonds remained in some Lehman indices and were inadvertently priced in our original study using the non-zero trader-supplied price. We have revised our search criteria for defaulted bonds and the definition of the default month to identify all defaulted bonds, even those that remain in a Lehman index, and override any index database price with our assumed default price (e.g., zero). In general, these refinements make our results more conservative than our initial results.

This update also allows us to improve our methodology for calculating excess returns to corporates. For the original study, we calculated a distressed bond's excess return to corporates by calculating its cumulative twenty-four month excess return versus a composite credit index. The composite credit index consisted of corporate issues from

---

[1] "Return Performance of Investment-Grade Bonds after Distress," *Global Relative Value*, Lehman Brothers. For this study, we used market data through June 30, 2002, for investment-grade bonds identified as distressed by May 31, 2002.

[2] A bond's "distress month" is the month in which it first becomes distressed.

[3] A bond's "vintage" is the year in which it first becomes distressed.

the Lehman Credit Index belonging to the same quality bucket as the distressed bond. Long and short issues in the composite index were weighted so as to match the duration of the distressed bond. To calculate excess returns more precisely, we now construct a distressed bond's composite credit index using only issues from the same sector as the distressed bond, as well as maintaining the duration and quality match.

Finally, at the end of this update, we examine how the results change if we assume a default price of 20% of par rather than our previously assumed, and possibly severe,[4] default price of zero. We show results for both default price assumptions.

We present all of the tables from the original study (using the same corresponding figure numbers) updated through March 31, 2003, using bonds that became distressed by February 28, 2003. We offer comments on the updated study, and in many areas we highlight how the results have changed since the original study.

2. Identifying Distressed Investment-Grade Bonds

We define a distressed investment-grade bond as a security that:

a) Is rated Baa3 or higher;
b) Has a fixed coupon of at least 2%;
c) Has an option-adjusted spread to U.S. Treasuries greater than or equal to 400 bp; and
d) Has an index dollar price of less than 80% of par.

Figure 1 shows that in 2002, 271 investment-grade bond issues, accounting for 5.6% of the outstanding market value and 8.5% of the par value of the Credit Index, became distressed. (The year's final tally was up sharply from 68 at the end of May 2002). As of February 28, 2003, the overall dataset has 577 distressed bonds rather than the 372 bonds as of May 2002. Two issues become distressed in the first two months of 2003.

Missing vintage years had no issues that satisfied distress criteria.

What eventually happens to these distressed issues? By and large they recover. As shown in Figure 2, 361 of the 577 distressed issues, or 63%, became "non-distressed" within twenty-four months of their distress month. This number will likely rise as the 2002 and 2003 vintages season. Figure 2 updates the distribution of the status of distressed bonds twenty-four months after the distress month. For issues distressed prior to 2001, approximately 75% either matured or became "non-distressed" within twenty-four months of their distress month. Of the remaining 25%, 8% defaulted and 17% remained distressed. For issues distressed since 2001, approximately 55% have become "non-distressed" so far, 15% have defaulted, and the remaining 30% remain distressed.

[4] For example, it was widely reported on April 14, 2003 that WorldCom debt holders will receive about 36 cents on the dollar under the proposed reorganization plan (CNN/Money web site: April 14, 2003).

3. Total Return and Excess Return Performance of Distressed Bonds

We measure the performance of each distressed issue for twenty-four months, if possible, subsequent to, but not including, its distress month. We present both cumulative total returns and cumulative excess returns to duration-matched U.S. Treasuries.[5] For bonds that default, we assume a price of zero at the end of their default month. This assumption will be relaxed later in this study.

[5] Cumulative excess returns are aggregated from the bond's monthly total returns and excess returns. For all months in which the bond was in the Lehman Brothers Family of Indices at least at the beginning of the month, we used the excess return recorded in our records for the bond for that month. If the bond was no longer in the Lehman Brothers Family of Indices as of the beginning of the month, the bond's excess return for the month was calculated by subtracting the total return on a Treasury with duration close to the last reliable duration measurement of the bond from the total return on the bond.

Figure 1. **All Distressed Issues Summary Information, 1990-2003, Sorted by Vintage Year** ($ Million)

		Amount Par Outstanding		Amount Market Value Outstanding	
	# Distressed Issues	Distressed Issues	As % of Credit Index	Distressed Issues	As % of Credit Index
Vintage Year					
1990	50	$9,731	1.70%	$7,326	1.36%
1991	14	1,953	0.34%	1,506	0.24%
1992	1	75	0.01%	60	0.01%
1994	1	248	0.04%	192	0.03%
1995	5	900	0.13%	690	0.09%
1996	1	100	0.01%	83	0.01%
1998	29	6,992	0.65%	5,253	0.45%
1999	10	2,375	0.20%	1,840	0.16%
2000	139	36,746	2.62%	27,162	1.93%
2001	54	17,939	1.01%	13,329	0.72%
2002	271	158,227	8.53%	113,998	5.60%
2003*	2	542	0.03%	427	0.02%
Total	577				

* Updated through 31 March 2003 using bonds that became distressed by February 28, 2003.
Missing vintage years had no issues that satisfied distress criteria.

Figure 2. **Status of Distressed Issues (Up-to) 24 Months After Distress Month,** 1990-2003*

	Issues with Distress Month Prior to 2001	Issues with Distress Month Since 2001
Defaulted:	21	49
Matured:	5	0
Remained distressed:	42	99
Non-distressed:	182	179
Total	250 issues	327 issues

* Updated through March 31, 2003 using bonds that became distressed by February 28, 2003.

Figures 3a and 3b show, respectively, the cumulative total and excess returns of distressed bonds for the twenty-four month period (if available) after the distress month. The distressed issues are sorted by distress month, with the issues with the earliest distress month appearing at the left end of the horizontal axis of the figure and those with the latest distress month appearing at the right end. The vertical line demarks issues that become distressed before and since January 2001. The updated results continue to show that total and excess returns for distressed bonds have generally been positive.

Figure 3a. **Cumulative Total Return Performance of Distressed Bonds**
24 Months (If Available) after Distress Month
January 1990-March 2003; Observations Sorted by Distress Month
(Returns data through March 2003 for bonds distressed by February 2003. Prices for defaulted bonds set to zero at end of default month.)

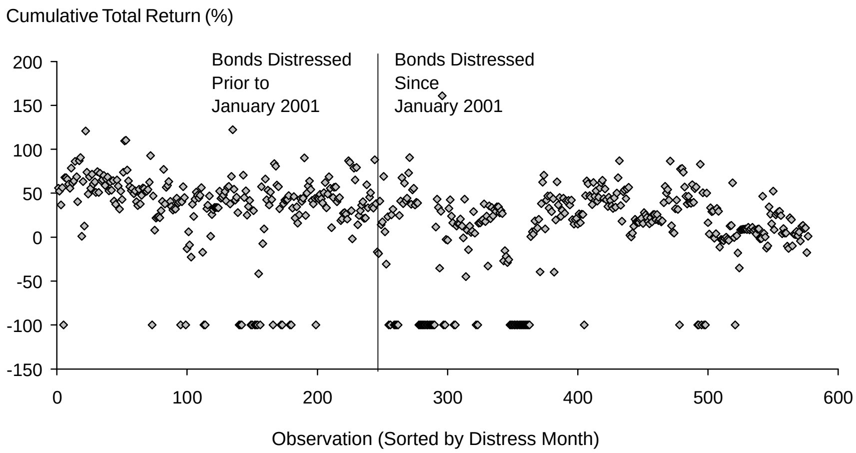
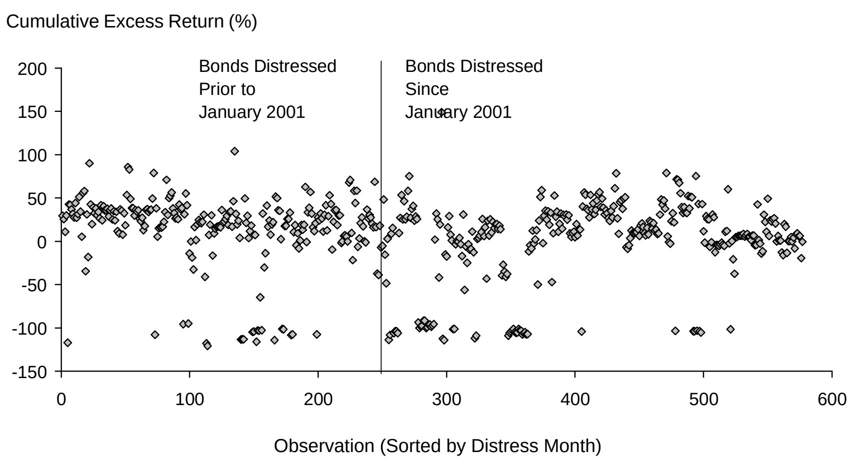


Figure 3b. **Cumulative Excess Return Performance of Distressed Bonds**
24 Months (If Available) after Distress Month
January 1990-March 2003; Observations Sorted by Distress Month
(Returns data through March 2003 for bonds distressed by February 2003. Prices for defaulted bonds set to zero at end of default month.)



It is worth noting, however, that the twenty-four month (if available) cumulative excess returns for bonds distressed since January 2001 has risen from -23.71% as reported in the initial study to -1.23% now. This improvement is due primarily to the better performance of the numerous bonds distressed after January 2002. To show the improvement, we presents excerpts from Figure 4 of our original study (shown in gray as "2001 (June '02)") as well as the updated numbers (shown in bold) from Figure 4 above, which include July 2002-March 2003. Note that the 2001 vintage continues to perform poorly, with an excess return of -25.42% that is actually worse than the originally reported number of -23.08%. The 2001 vintage has had some time to start showing some recovery, but there seems little indication that this vintage year will ever recover. Keep in mind that this vintage is dominated by Enron issues. If we were to exclude Enron issues from the 2001 vintage, the twenty-four month cumulative total and excess returns would be 18.06% and 4.92% respectively.

Vintage year 2002 is another story and seems to be recovering nicely, as the earlier vintages generally did (2001 notwithstanding). Originally, we reported 68 distressed issues for 2002 (through May 2002) with cumulative total and excess returns of -21.62% and -24.21%, respectively. These return numbers were dominated by WorldCom, which became distressed in April 2002. Many more issues became distressed later in 2002. However, the vintage is recovering nicely. By the end of March 2003, the vintage

Figure 4. **Performance of Distressed Bonds**
Cumulative Total and Excess Returns vs. Duration-Matched Treasuries
24 Months (If Available) after Distress Month
Results by Vintage Year: 1990-2003

	# Observations	24-Month Cumulative Total Return	24-Month Cumulative Excess Return vs. Duration-Matched UST
Vintage Year			
1990	50	56.80%	27.71%
1991	14	62.18%	40.94%
1992	1	47.38%	17.65%
1994	1	56.22%	36.36%
1995	5	55.11%	38.63%
1996	1	92.99%	78.93%
1998	29	22.03%	17.53%
1999	10	32.06%	10.69%
2000	139	23.79%	4.20%
2001	54	-16.26%**	-25.42%**
2002	271	10.81%**	3.66%**
2003*	2	-8.19%**	-9.97%**
Vintage Years Prior			
2001	250	33.79%	13.93%
Vintage Years Since			
2001	327	6.22%**	-1.23%**
All Vintage Years	577	18.17%	5.34%

* Updated through 31 March 2003 using bonds that became distressed by 28 February 2003.
** Issues of the 2001, 2002, and 2003 vintages generally do not have a full twenty-four months of returns since their distress month.
Default recovery is assumed equal to zero.

had cumulative total and excess returns of 10.81% and 3.66%, respectively. If we were to exclude WorldCom issues from the 2002 vintage, the twenty-four month cumulative total and excess returns as of March 2003 would be 21.13% and 13.86%, respectively.

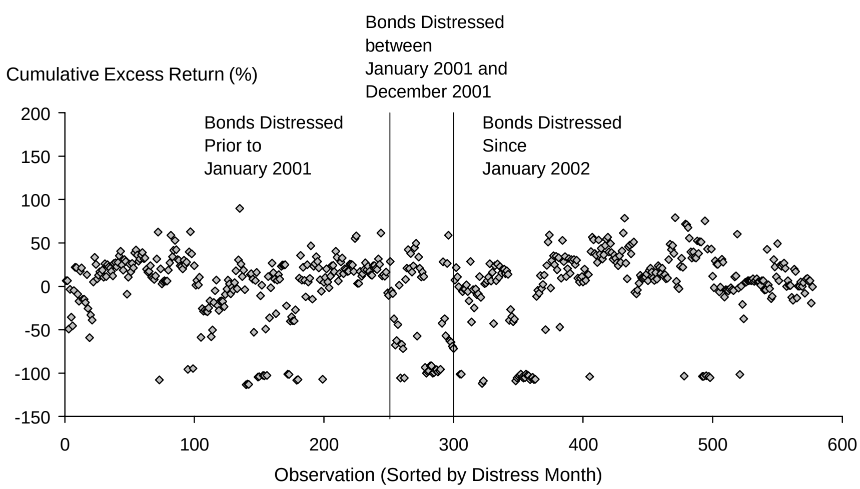
As we argued in the earlier study, the relatively poor twenty-four-month performance for bonds distressed since January 2001 compared with those distressed before January 2001 may be caused, in part, by the relative lack of time for the more recent issues to resolve their creditworthiness. Figures 5 and 6 present the updated twelve-month cumulative excess returns. As shown in the earlier study, for bonds distressed prior to

Excerpts from Figure 4 of Original and Updated Studies
Performance of Vintage Year 2001 and 2002 Distressed Bonds
Cumulative Total and Excess Returns vs. Duration-Matched Treasuries
24 Months (If Available) after Distress Month

Vintage Year (Results Month)	**# Observations**	**24-Month Cumulative Total Return**	**24-Month Cumulative Excess Return vs. Dur.-Matched UST**
2001 (June 2002)	54	-21.09%*	-23.08%*
2001 (Mar 2003)	54	-16.26%	-25.42%*
2002 (June 2002)	68	-21.62%*	-24.21%*
2002 (Mar 2003)	271	10.81%	3.66%*

* Most issues of the 2001 and 2002 vintages do not have 24 months of returns since their distress month.
Default recovery is assumed equal to zero.

Figure 5. **Cumulative Excess Return Performance of Distressed Bonds**
12 Months (If Available) after Distress Month
January 1990-March 2003; Observations Sorted by Distress Month
(Returns data through March 2003 for bonds distressed by February 2003. Prices for defaulted bonds set to zero at end of default month.)



2001 the twelve-month cumulative excess returns (3.01%) were significantly worse than their twenty-four month cumulative excess returns (13.93%),[6] indicating that distressed bonds tend to improve strongly in their second year following distress. Figures 5 and 6 also show that the performances across vintages are more similar if we examine performance only over the first twelve months since the distress month. Perhaps the relatively poor twenty-four month performance numbers for the 2001 and 2002 vintages are due in part to the fact that these vintages have not yet experienced their full second-year recovery.

Although the twenty-four month cumulative excess returns for the 2001 vintage are better than its twelve-month cumulative excess returns (-25.42% vs. -32.53%, respectively), the vintage remains a very poor performer relative to the other vintages. It seems

[6] As discussed in the introduction, we have refined our dataset since the original study. In general, these refinements produce results more conservative than those initially reported. For example, we initially reported that the twelve and twenty-four month excess returns for the prior-2001 vintages was 3.32% and 16.56%, respectively.

Figure 6. **Performance of Distressed Bonds**
Cumulative Total Returns and Cumulative Excess Returns vs. Duration-Matched Treasuries
24- and 12-Months (If Available) after Distress Month
Results by Vintage Year: 1990-2002

	# Issues	24-Month Cumulative Total Return	24-Month Cumulative Excess Return vs. Dur.-Matched UST	12-Month Cumulative Total Return	12-Month Cumulative Excess Return vs. Dur.-Matched UST
Vintage Year					
1990	50	56.80%	27.71%	21.72%	6.52%
1991	14	62.18%	40.94%	41.28%	29.74%
1992	1	47.38%	17.65%	32.17%	17.37%
1994	1	56.22%	36.36%	40.97%	23.78%
1995	5	55.11%	38.63%	19.22%	14.21%
1996	1	92.99%	78.93%	64.78%	62.39%
1998	29	22.03%	17.53%	10.62%	13.72%
1999	10	32.06%	10.69%	-16.10%	-20.52%
2000	139	23.79%	4.20%	9.04%	-2.56%
2001	54	-16.26%**	-25.42%**	-25.82%**	-32.53%**
2002	271	10.81%**	3.66%**	10.78%**	3.67%**
2003*	2	-8.19%**	-9.97%**	-8.19%**	-9.97%**
Vintage Years Prior to 2001	250	33.79%	13.93%	13.21%	3.01%
Vintage Years Since 2001	327	6.22%**	-1.23%**	4.62%**	-2.39%**
All Vintage Years	577	18.17%**	5.34%**	8.34%**	-0.05%**

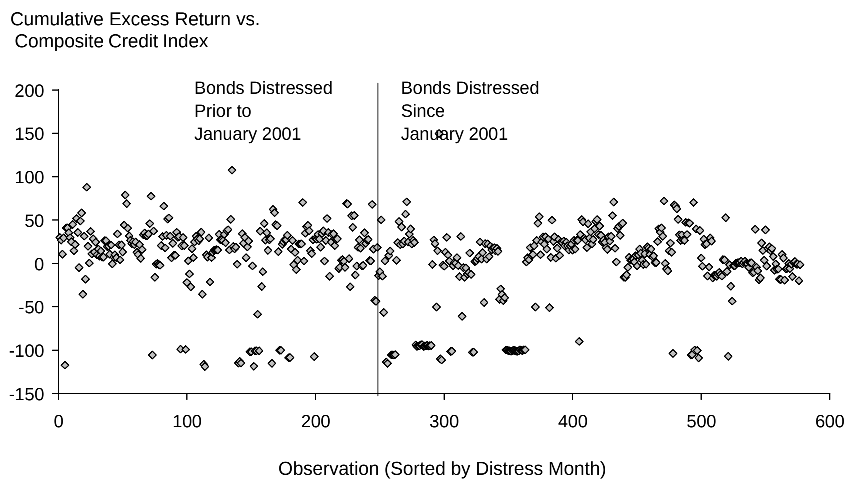
* Through March 31, 2003 using bonds that became distressed by February 28, 2003.
Default recovery is assumed equal to zero.
** Issues of the 2002 and 2003 vintages generally do not have a full twelve months of returns since their distress month. Issues of the 2001, 2002 and 2003 vintages

likely that the twenty-four month cumulative excess return for the vintage will finish very negative-the only vintage year to do so. This vintage (as well as the untested 2002 vintage) may have characteristics (e.g., fraud and greater leverage) that will ultimately cause its returns behavior to deviate permanently from that of the other vintages.

As we discussed in the earlier study, one possible explanation for the strong cumulative excess returns of distressed bonds may simply be the outperformance of credit product in general versus Treasuries. It is possible that credit spreads were particularly wide during years in which there were a number of distressed bonds and that the subsequent twenty-four months of strong excess returns may simply reflect the general recovery of credit spreads. If this is so, distressed investment-grade bonds may not have anything special to offer investors. To test this notion, we adjust the performance of a distressed bond for the performance of the credit sector by calculating the bond's excess return to corporates, defined as the bond's cumulative excess return versus its composite credit index. The composite credit index for each distressed bond consists of corporate issues from the Lehman Credit Index (which includes any distressed issues which remain in the index) belonging to the same quality-sector bucket as the distressed bond. Long and short issues in the index are weighted so as to match the duration of the distressed bond.

Figures 7 and 8 present the cumulative excess returns of distressed bonds versus their respective composite credit indices. In our earlier study, we did not control for sector exposure in the calculation of excess returns to corporates. Overall, however, the results remain the same: distressed bonds tend to outperform their corporate bond counter-parts. For vintage years prior to 2001, distressed investment-grade bonds outper-formed their sector-quality-duration matched credit composite indices by

Figure 7. **Performance of Distressed Bonds**
Cumulative Excess Returns vs. Quality-, Duration-, and Sector-Matched Credit Index
24-Month Performance Horizon
January 1990-March 2003; Observations Sorted by Distress Month
(Returns data through March 2003 for bonds distressed by February 2003. Prices for defaulted bonds set to zero at end of default month.)



10.65 percentage points in the twenty-four months after distress. (This is a change from 15.51 percentage points when we did not control for sector exposure.) The strongly positive excess return to corporates indicates that distressed bonds do, in fact, offer higher returns than credits in general.

For vintage years 2001 and on, twenty-four month (if available) cumulative excess performance versus the composite credit index has changed from -22.28% to -4.03%. The improvement in the recent vintages is due to the overall improvement in the 2002 vintage (from -22.03% to 0.37%), which includes many bonds that became distressed after May 2002 and whose relative performance to date has been better than the bonds distressed earlier in 2002. As with excess returns to treasuries, the performance of the 2001 vintage, this time versus its composite corporate index, has remained poor. The twenty-four month cumulative performance of the 2001 vintage changed from -22.59% to -25.90%. Some of this deterioration may be due to our revised method that controls for sector exposure. Of course, it may also be due to the distinctly inferior quality of this vintage.

Is there any particular pattern to the cumulative excess returns (to treasuries) of distressed issues? In the original study, we examined whether issues with shorter duration (as measured at the end of the distress month) have better excess return

Figure 8. **Performance of Distressed Bonds**
Cumulative Excess Returns vs. Quality-, Duration-, and Sector-Matched Credit Index
24 Months (If Available) after Distress Month
Results by Vintage Year

	# Issues	24-Month Excess Return vs. Quality-, Duration-, and Sector-Matched Credit Index
Vintage Year		
1990	50	18.56%
1991	14	31.12%
1992	1	15.86%
1994	1	33.15%
1995	5	35.70%
1996	1	77.58%
1998	29	7.40%
1999	10	15.94%
2000	139	4.46%
2001	54	-25.90%**
2002	271	0.37%**
2003*	2	-10.78%**
Vintage Years Prior		
2001	250	10.65%
Vintage Years Since		
2001	327	-4.03%**
All Vintage Years	577	2.33%

* Through 31 March 2003 using bonds that became distressed by 28 February 2003.
Default recovery is assumed equal to zero.
** Issues of the 2001, 2002, and 2003 vintages do not generally have twenty-four months of returns since their distress month.

performance than longer-duration issues. Figures 9a (for the 1990-2000 vintages) and 9b (for the 2001-2003 vintages) show the relationship between a bond's duration and its cumulative twenty-four month (if available) excess return. We continue to see little relationship between the two.

In the original study, we also addressed the widely held perception in the marketplace (at the time, at least!) that recently distressed issues have a much lower price at the end of their distress month than distressed issues of earlier years. In other words, the opinion is that when an issue gets into trouble, the market has reacted much more severely in recent years than in earlier years.

Figure 9a. **Performance of Distressed Bonds**
Cumulative 24-Month (if available) Excess Returns vs. Duration
1990-2000
(Prices for defaulted bonds set to zero at end of default month.)

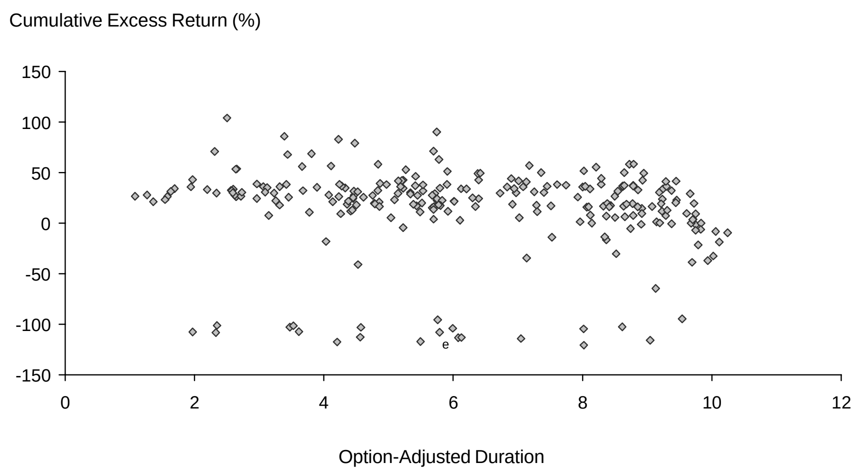
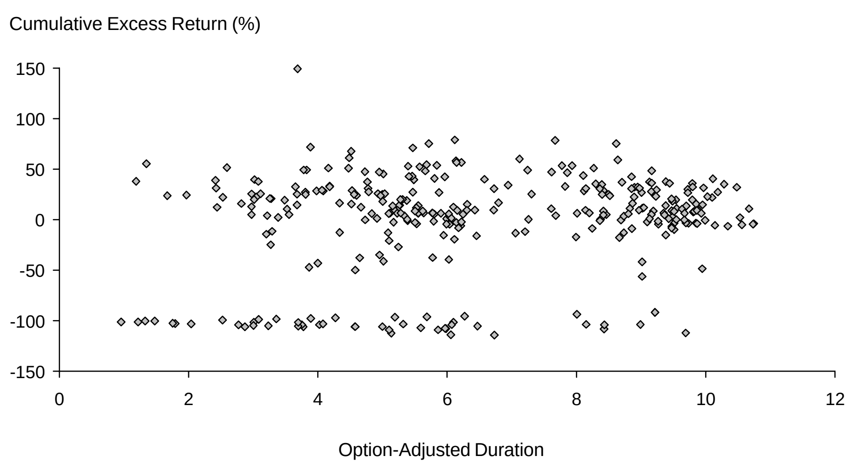


Figure 9b. **Performance of Distressed Bonds**
Cumulative Excess Returns vs. Duration
2001-2003 Vintage Years
(Prices for defaulted bonds set to zero at end of default month.)



This market reaction to distress should appear in the issue's price at the end of its distress month. If the market is now more unforgiving of distress, then we should observe lower prices at the end of the distress month. Figure 10 plots the prices of distressed issues at the end of their distress months. As we reported earlier, we see little change over time in the price of a distressed issue at the distress month. As of March 2003, the average price of a distressed bond at the end of its distressed month was 73.26 for distressed issues prior to 2001 and 72.01 for distressed issues since 2001.

Finally, to complete our updates of the figures in the original study, we discuss the idea of a "knife-edge" price for distressed bonds. Our original study asked if there were an association between a distressed bond's price at the end of its distress month and its subsequent cumulative excess return performance. In other words, do bonds that get hit hardest in price at the outset tend to have worse subsequent cumulative excess returns? Is there a "knife-edge" end-of-distress-month price below which bonds tend never to recover? Figure 11 shows the association between a bond's price at the end of its distress month and its subsequent cumulative excess returns.

Figure 12 (not published in the original study) graphically presents the information in Figure 11. The knife-edge (for cumulative twelve-month excess returns) is clearly at a price of 50 for both the before-2001 and since-2001 vintages.

Presented below are excerpts from Figure 11 above and from Figure 11 of the original study. What is particularly noteworthy is that when we first reported our results, based on the data as of June 2002, it appeared that the knife-edge price had risen in recent years. However, at that time many of the observations for the since-2001 vintages had had very little seasoning. The results as of March 2003 seem to indicate that a distress month price of 50 remains the knife-edge point, both for the before-2001 and since-2001 vintages.

Figure 10. **Price of Distressed Issue at End of Distress Month**
January 1990-March 2003; Observations Sorted by Distress Month

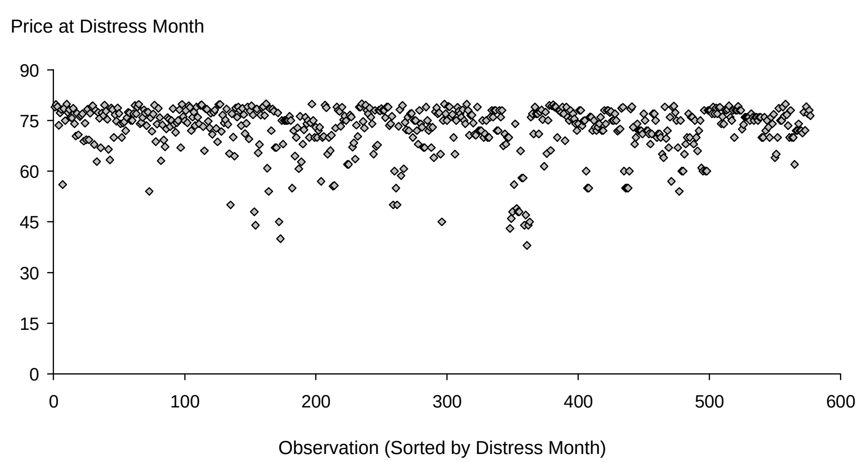
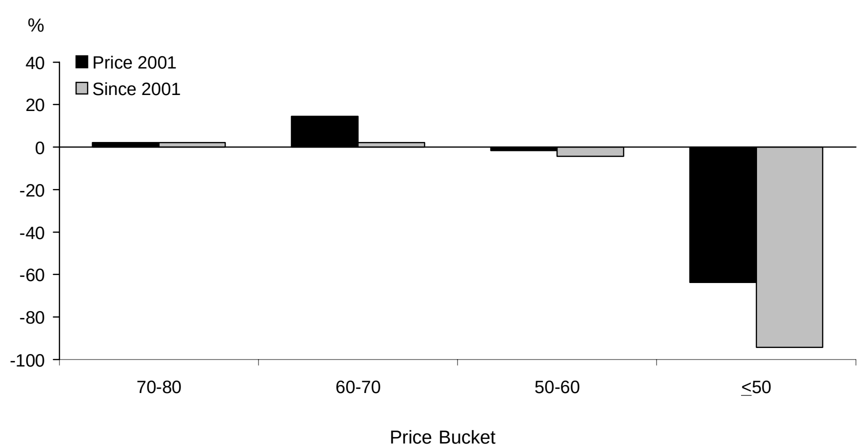


Figure 11. **Performance of Distressed Bonds**
Cumulative 12- and 24-Month Excess Returns vs.
Price at End of Distress Month
1990-2003
(Returns data through March 2003 for bonds distressed through February 2003. Prices for defaulted bonds set to zero at end of default month.)

Distress Month Price Bucket	**# issues**	**12-Month Cumulative Excess Return**	**24-Month Cumulative Excess Return**
1990-2003			
80 ≥ P > 70	432	2.15%	7.91%
70 ≥ P > 60	98	7.99%	13.22%
60 ≥ P > 50	28	-3.71%	-3.39%
50 ≥ P	19	-86.27%	-80.80%
Prior to 2001			
80 ≥ P > 70	192	2.16%	13.40%
70 ≥ P > 60	46	14.56%	25.23%
60 ≥ P > 50	7	-1.64%	7.91%
50 ≥ P	5	-63.77%	-60.97%
Since 2001			
80 ≥ P > 70	240	2.15%	3.52%*
70 ≥ P > 60	52	2.18%	2.60%*
60 ≥ P > 50	21	-4.40%	-7.15%*
50 ≥ P	14	-94.31%	-87.88%*

* Most observations since 2001 do not have a full 24-month performance period.

Figure 12. **Performance of Distressed Bonds**
Cumulative 12-Month Excess Returns vs. Price at End of Distress Month
Before-2001 Vintages vs. Since-2001 Vintages



4. Return Performance Assuming Recoveries on Bonds that Default

The original study assumed a default price of zero at the default month. This is perhaps an extreme assumption, as most defaulted issues have at least some recovery value. To see how sensitive our results are to the default price assumption, we re-ran our numbers assuming a recovery value equal to the lesser of the bond's price at the end of its default month and 20% of par. Although we label this scenario "default price = $20," in many cases we use the bond's price at the end of its default month, which was less than $20. The following figures are new.

Figure 13 presents the twelve- and twenty-four month total and excess returns for distressed bonds assuming default price = $20. (Figure 13 corresponds to Figure 6.) As expected, the performance of distressed bonds improves, especially for the more recent vintages. The twelve-month excess cumulative returns for the combined vintage years 2001-2003 increase from -2.39% to 1.20%. For vintage years prior to 2001, the improvement is from 3.01% to 5.12%. For all vintage years combined, the twelve-month excess return over Treasuries for distressed bonds improves from -0.05% to 2.90% assuming a default price equal to the minimum of $20 or the bond's full price at the end of its default month.

Figure 14 shows the twenty-four month cumulative excess returns of distressed bonds versus a quality-, duration-, and sector-matched composite corporate index assuming default price = $20. (Figure 14 corresponds to Figure 8.) For the combined vintage years 2001 through 2003, the twenty-four month (if available) cumulative excess returns to corporates increase from -4.03% to 0.27%. For vintage years prior to 2001, the improvement is from 10.65% to 13.32%. While assuming a non-zero default price improves the results, it is not the key to the story. Distressed investment-grade bonds outperform duration-matched Treasuries and quality-, duration-, and sector-matched corporates irrespective of the assumed default recovery value.

Excerpts from Figure 11 of Original and Updated Studies

Performance of Distressed Bonds

Cumulative 12-Month Excess Returns vs. Price at End of Distress Month

Price Bucket	Distress Month # Issues	June 2002 12-Month Cumulative Excess Return	March 2003 12-Month Cumulative Excess Return
Prior 2001			
80 ≥ P > 70	192	2.15%	2.16%
70 ≥ P > 60	46	14.55%	14.56%
60 ≥ P > 50	7	9.73%	-1.64%
50 ≥ P	5	-64.01%	-63.77%
Since 2001			
80 ≥ P > 70	240	-13.76%	2.15%
70 ≥ P > 60	52	-41.41%	2.18%
60 ≥ P > 50	21	-49.56%	-4.40%
50 ≥ P	14	-48.05%	-94.31%

* Most observations since 2001 do not have a full twenty-four month performance period.

5. Conclusion

In August 2002, with memories of the Enron and WorldCom disasters still fresh, we published a study that addressed this question: If investment-grade bonds in a portfolio become distressed, should the manager hold them or sell them? Is there a good chance the bonds will recover and provide attractive returns, or is it more likely that they are doomed never to recover? The study showed that the manager should hold the bonds; distressed bonds as a group had experienced positive total and excess returns in the 24 months after becoming distressed, though it appeared that bonds that had become distressed since January 2001 had not fared nearly as well as earlier distressed bonds. We wondered aloud in the study whether the post-January 2001 bonds were fundamentally poorer performers than the earlier distressed bonds or simply had not had enough time since becoming distressed to recover fully.

Since then, as the corporate bond market has stabilized and the post-January 2001 bonds have had more time to recover, investors familiar with our study have asked us follow-up questions. Are the post-January 2001 bonds doing better, now that they have had more time to recover? More generally, how have the conclusions of the August 2002 study held up in light of more recent data?

Figure 13. **Performance of Distressed Bonds**
Cumulative Total Returns and Cumulative Excess Returns vs. Duration-Matched Treasuries
24- and 12-Months (if available) after Distress Month
Results by Vintage Year: 1990-2003

	# Issues	24-Month Total Return	24-Month Excess Return vs. Dur.-Matched UST	12-Month Total Return	12-Month Excess Return vs. Dur.-Matched UST
Vintage Year					
1990	50	57.90%	27.81%	21.72%	6.52%
1991	14	62.18%	40.94%	41.28%	29.74%
1992	1	47.38%	17.65%	32.17%	17.37%
1994	1	56.22%	36.36%	40.97%	23.78%
1995	5	55.11%	38.63%	19.22%	14.21%
1996	1	92.99%	78.93%	64.78%	62.39%
1998	29	25.42%	20.93%	14.01%	17.12%
1999	10	32.06%	10.69%	-16.10%	-20.52%
2000	139	27.85%	8.26%**	12.12%	0.52%
2001	54	-5.45%**	-14.62%**	-19.35%**	-26.06%**
2002	271	13.85%	6.70%**	13.82%**	6.71%**
2003*	2	-8.19%	-9.97%**	-8.19%**	-9.97%**
Vintage Years Prior to 2001	250	36.47%	16.61%	15.31%	5.12%
Vintage Years Since 2001	327	10.53%**	3.08%**	8.21%**	1.20%**
All Vintage Years	577	21.77%	8.94%	11.29%	2.90%

* Through March 31, 2003 using bonds that became distressed by February 28, 2003.
Default recovery is assumed equal to MIN [price at end of default month, $20].
** Issues of the 2002 and 2003 vintages do not have a full twelve months of returns since their distress month. Issues of the 2001-2003 vintages do not have twenty-four months of returns since their distress month.

In this update to the original study, we show that the more recent market data support the study's main conclusion, namely that distressed bonds generally recover within 24 months of distress and produce attractive returns, even in comparison to other credits with similar characteristics. We also show that the post-January 2001 bonds, which had performed poorly as of August 2002 compared with earlier distressed bonds, have recovered to a great extent, though it appears that the 2001 vintage will probably never recover. (The poor performance of the 2001 vintage is due to Enron.) We also revised the findings of our earlier study regarding the "knife-edge" price, i.e., the end-of-distress-month price level below which a distressed bond is unlikely to recover. The knife-edge price for bonds that became distressed before 2001 was $50. In August 2002 it appeared that the knife-edge price had risen since January 2001, but subsequent data show that the knife-edge price for the 2001-2003 vintages is $50, as well.

Other questions that we have not yet addressed come to mind. What happens to distressed bonds after the 24-month recovery period? Is their recovery sustained, or do the prices of these bonds tend to sink again? Once a bond has become distressed, are there any leading indicators that give us some idea whether or not the bond will recover? How applicable are these conclusions in markets outside the U.S.? We hope to take up some of these questions in future updates.

Figure 14. **Performance of Distressed Bonds**

Cumulative Excess Returns vs. Quality- and Duration-Matched Credit Index
24-Months (If Available) after Distress Month
Results by Vintage Year

	# Issues	24-Month Excess Return vs. Quality-, Duration, and Sector-Matched Credit Index
Vintage Year		
1990	50	18.66%
1991	14	31.12%
1992	1	15.86%
1994	1	33.15%
1995	5	35.70%
1996	1	77.58%
1998	29	10.80%
1999	10	15.94%
2000	139	8.52%*
2001	54	-15.10%*
2002	271	3.42%*
2003*	2	-10.78%*
Vintage Years Prior		
2001	250	13.32%
Vintage Years Since		
2001	327	0.27%*
All Vintage Years	577	5.93%

* Through March 31, 2003 using bonds that became distressed by February 28, 2003.
Default recovery is assumed equal to MIN [price at end of default month, $20].
** Issues of the 2001, 2002, and 2003 vintages do not generally have 24 months of returns since their distress month.

I, Bruce Phelps, hereby certify (1) that the views expressed in this research report accurately reflect my personal views about any or all of the subject securities or issuers referred to in this report and (2) no part of my compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this report.

Any reports referenced herein published after 14 April 2003 have been certified in accordance with Regulation AC. To obtain copies of these reports and their certifications, please contact Larry Pindyck (lpindyck@lehman.com; 212-526-6268) or Valerie Monchi (vmonchi@lehman.com; 1-011-44-207-011-8035).

Lehman Brothers usually makes a market in the securities mentioned in this report. This company is a current investment banking client of Lehman Brothers or a company for which Lehman Brothers would like to perform investment banking services.

Publications—L. Pindyck, A. DiTizio, B. Davenport, W. Lee, D. Kramer, R. Madison, A. Acevedo, K. Kim, V. Monchi, C. Rial, K. Banham, G. Garnham