

CAPTURING CREDIT SPREAD PREMIUM

Alternative Benchmarks for Credit Investors

- Although credit spread volatility can produce very negative reported index excess returns, investors tend to try to ride out this volatility on the expectation that a persistent allocation to credit will, over time, capture excess returns (net of default losses) over Treasuries. During the recent credit crisis, however, investors questioned the value of a persistent allocation to IG credit.
- We show that IG credit bonds, as an asset class, have consistently generated substantial excess returns net of default losses. These excess returns are often referred to as the credit spread premium.
- However, this finding does not mean that investors have captured this premium. Most investors get their persistent credit allocation exposure by adopting a benchmark such as the Barclays Capital IG Corporate Index. The Corporate Index is a dynamic set of bonds with rules that require selling bonds out of the index as a result of: downgrade below investment grade; an amount outstanding falling below periodically revised index liquidity constraints; or a remaining maturity of less than one year.
- We show that these index rules have constrained the ability of investors to capture a larger credit spread premium. We propose some alternative credit benchmarks that would have allowed investors with a persistent credit allocation to capture a spread premium (86bp/y) almost 80% larger than that offered by the IG Corporate Index (48bp/y). These alternative benchmarks have the same overall risk properties as the IG Corporate Index, despite having small (i.e., 6%) exposures to high yield.
- For portfolio managers benchmarked against the IG Corporate Index, these results suggest a long-term strategy for benchmark outperformance. In other words, if managers have permission to hold on to bonds that the Corporate Index discards, managers should be able to harvest the additional credit spread premium and outperform the benchmark.

Kwok Yuen Ng
212-526-6685
kwok-yuen.ng@barcap.com

Bruce Phelps
+1 212 526 9205
bphelps@barcap.com

www.barcap.com

Introduction

Periods of poor credit bond returns often generate a reassessment of whether credit should be a permanent part of an investor's fixed-income allocation. In fact, at year-end 2009, despite a strong credit market rally, the average annual reported index excess return to duration-matched Treasuries since 1990 for the Barclays Capital US IG Corporate Index was only 27bp/y with an annual standard deviation of 741bp.¹ For investors looking to credit bonds as a way to clip some more coupon with modest additional risk, this performance is not particularly attractive. In response, investors are asking if there might be better ways to obtain credit exposure or if they should abandon a persistent allocation to credit and rely on the asset class solely as a market-timing tool.

In recent years, there has been a flurry of discussion regarding alternative credit benchmarks to traditional market-capitalization-weighted benchmarks, such as the Barclays Capital IG Corporate Index. A criticism of market cap indices is that profligate issuers can become a large percentage of the index, exposing benchmarks and, hence, investors to issuer event risk and underperformance. In the early 2000s, the emphasis was on issuer-capped credit benchmarks to limit event risk to large issuers.² However, enthusiasm for issuer-capped indices wanes as credit markets recover. More recently, attention has shifted to "fundamental" benchmarks that assign index weights depending on the value characteristics of an eligible bond.³ The idea is that these benchmarks are likely to generate greater excess returns than conventional benchmarks. In response, purveyors of market capitalization indices argue that market cap indices better reflect the investable universe and that tilting a portfolio to a more "value" orientation is an active strategy and should not be confused with the benchmark determination.

Another criticism of a credit allocation in a fixed-income benchmark is that credit excess returns are too highly correlated with equity market returns, especially during equity market reversals when the allocation to fixed-income is most needed. In fact, over the past 20 years, the four worst years of equity market returns include the three worst years for reported credit index excess returns. Even if credit excess returns were greater, these investors would likely argue that credit should play a minor role in their fixed-income allocation. This is certainly an issue worthy of further discussion. For now, however, we accept that, for whatever reason, investors are maintaining a persistent allocation to credit in their benchmark decisions.

We suspect that many investors maintain a persistent allocation to credit because they believe that if they can disregard transitory spread volatility, credit bonds will, in time, earn an excess return net of default losses – a **credit spread premium** – over comparable duration Treasury bonds. To avoid confusion we use the term "reported index excess return" to refer to excess returns (i.e., total return of credit bonds less total return of duration-matched Treasuries) that include the impact of spread changes in addition to default losses. These are the reported index excess returns that investors can obtain from the Barclays Capital Family of Indices. We use the term "spread premium" to refer to credit bond total returns in excess of Treasury returns including the impact of realized default losses but not the impact of credit spread changes. A buy-and-hold credit investor will earn

¹ Ignoring the very volatile 2008-09 period does not significantly improve the information ratio for the sector. In 1990-2007, the average annual reported index excess return was 14bp/yr, with an annual standard deviation of 278bp.

² For a discussion of issuer-capped credit benchmarks see: "Issuer-Capped and Downgrade-Tolerant U.S. Corporate Indices," Chapter 13, in L. Dynkin, J. Gould, V. Konstantinovskiy, J. Hyman, and B. Phelps, *Quantitative Management of Bond Portfolios*, Princeton University Press, 2007.

³ For a recent paper on this topic see: "Valuation-Indifferent Weighting for Bonds," R. Arnott, J. Hsu, F. Lei, and S. Shepherd, *Journal of Portfolio Management*, Spring 2010.

the spread premium at maturity (or default), whereas before maturity, the investor's mark-to-market will reflect the reported index excess return.

Our first question is: What has been the magnitude of the credit spread premium? If the credit spread premium is very low or highly volatile, then a persistent allocation to credit may not be warranted. Instead, the investor, or the asset manager, may just choose to occasionally time credit exposure.⁴ In fact, however, we show that credit has produced a surprisingly large credit spread premium - so large that some have referred to it as a "credit spread puzzle."

Our second question is: Are investors able to capture this credit spread premium? This may seem an odd question. If an investor has a persistent allocation to credit, then should not the credit spread premium just flow through? Not necessarily. Most investors use the Barclays Capital IG Corporate Index to represent their corporate portfolio allocation. However, the IG Corporate Index is not a static set of bonds. Indeed, the IG Corporate Index follows a set of rules that causes it to sell bonds periodically. If the index sells bonds at a time when their spreads are particularly wide, for reasons not related to expected default losses, then index rules may be constraining investors' ability to capture the credit spread premium. We seek to measure the impact of these constraints and to show that an alternative corporate index might enable investors to capture almost 80% more spread premium.

The results also suggest a stable, low volatility, long-term outperformance strategy for investment managers with clients who choose to stay with the IG Corporate Index as their performance benchmark. Managers should be able to harvest the additional credit spread premium and outperform the benchmark if they can retain bonds that the Corporate Index discards.

The Credit Spread Premium

At issuance, a credit bond offers a positive yield spread over a comparable maturity Treasury bond. Investors demand additional yield as compensation for the chance that the credit bond, unlike the Treasury bond, might default before maturity with a recovery value less than 100% of par. In addition, it is more expensive to execute a round-trip trade in a credit bond than for a Treasury bond. A credit investor, who anticipates selling the bond at some point, needs to be compensated for this expected liquidity cost by requiring a wider spread at time of purchase. Another factor contributing to the credit spread is that default losses and liquidity costs are both uncertain. In particular, both may tend to increase during tough macroeconomic times when investors need their credit assets to perform well. In such a world, risk-averse investors demand additional spread, a **risk premium**, beyond the expected default and liquidity costs, to compensate them for the possibility that the credit bond may have to be sold during bad economic times when default and liquidity costs are both high.

There are investors who can ride out difficult times with little need to liquidate portfolio holdings. These investors have an opportunity to recoup a credit bond's spread, net of realized default losses. An investor with a credit benchmark, or, in other words, an investor with a persistent credit allocation, seeks to earn, over time, this credit spread premium composed of expected liquidity costs and risk premium.

⁴ In a world with liquid credit derivatives, an investor could consider adopting a Treasury benchmark and then allow his investment manager the ability to time credit spreads by going long or short credit exposure with no persistent allocation to credit.

Measuring the Credit Spread Premium for the Barclays Capital IG Corporate Index

What has been the magnitude of the credit spread premium, i.e., excess returns over Treasuries reflecting only the impact of losses from defaults? We propose two ways of measuring the spread premium. The traditional way is to take the beginning of period spread (vs Treasuries) for a credit bond or index, and then subtract off the realized default loss experience of the bonds. We also do this. We use Moody's historical default and recovery data and the historical spread and composition data for the Barclays Capital IG Corporate Index as our representation of the corporate market. Another way to measure the credit spread premium is to take the IG Corporate Index reported excess returns (vs Treasuries), reflecting the mark-to-market performance of the bonds (including default), and add back or subtract the component of the reported index excess return attributable to market spread changes. Both methods should reach the same broad conclusion over long periods, although there may be variation over shorter periods. Fortunately, we have data back to 1990 which will allow us to use both methods to measure the credit spread premium over long periods of time.

1. Measuring the Credit Spread Premium Using Historical Default and Recovery Data

We first measure the spread premium using the actual default and loss-given-default record. Taking the average rating distribution and Treasury spread (OAS) levels of the Barclays Capital IG Corporate Index since 1990 as a representation of the corporate bond market, as well as Moody's cumulative default and average recovery rates⁵, we estimate the realized corporate spread premium with the simple calculation shown in Figure 1. For example, since 1990, the corporate market has consisted of a 33% market value weight to Baa bonds with an average OAS of 174bp. Over the past 20 years, Baa bonds have had a cumulative default rate of 0.41% with an average recovery of 44.6%.⁶ Multiplying these last two values and dividing by 20 (years), we obtain realized average annual losses from default for the Baa cohort of 22bp/y. With an average OAS of 174bp/y, the realized spread premium for Baa corporate bonds averaged 152bp/y over the past 20 years. After conducting the same exercise for the other three investment grade rating categories, we sum the market-value-weighted results and estimate that investment grade corporate bonds have earned an average annual spread premium of 118bp/y over the past 20 years. Although Figure 1 is produced using a simple calculation, similar results have been found by many other researchers and practitioners⁷.

Figure 1: Estimated Average Annual Credit Spread Premium Using Historical Default Data, IG Corporate Index, 1990-2009

Rating	Average IG Corporate Index MV weight	Average Spread (OAS) in bp	Annual Default Rate*	Average Loss Rate* (1 - RecRate)	Annual Loss due to Defaults in bp	Annual Excess Return in bp
Aaa	4.5%	79	0.02%	55.4%	1	78
Aa	16.5%	86	0.05%	55.4%	3	83
A	46.0%	118	0.16%	55.4%	9	109
Baa	33.0%	174	0.41%	55.4%	22	152
		130				118

* From Moody's Corporate Default and Recovery Rates, 1920 – 2009, February 2010.
Source: Moody's and Barclays Capital

⁵ Moody's Corporate Default and Recovery Rates, 1920-2009, Moody's Investors Service, February 2010.

⁶ We use the average recovery rate for all rating categories. The results are not very sensitive to other recovery rate assumptions.

⁷ See, for example, E. Elton, M. Gruber, D. Agrawal, and C. Mann. 2001. "Explaining the Rate Spread on Corporate Bonds." *Journal of Finance*.

Figure 2: Estimated Average Annual Credit Spread Premium Using Historical Default Data, IG Corporate Index, Five-Year Periods, 1990-2005, in bp

	Beginning Year															
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Annual Excess Return over Five-Year Period	100	157	111	88	72	74	60	46	49	99	97	186	166	183	87	65
Corporate Index OAS at Beginning of Five-Year Period	102	158	109	89	73	79	65	57	67	117	113	204	178	187	95	81
Excess Return as % of OAS	98%	99%	102%	98%	98%	93%	92%	81%	73%	85%	86%	91%	93%	98%	92%	80%

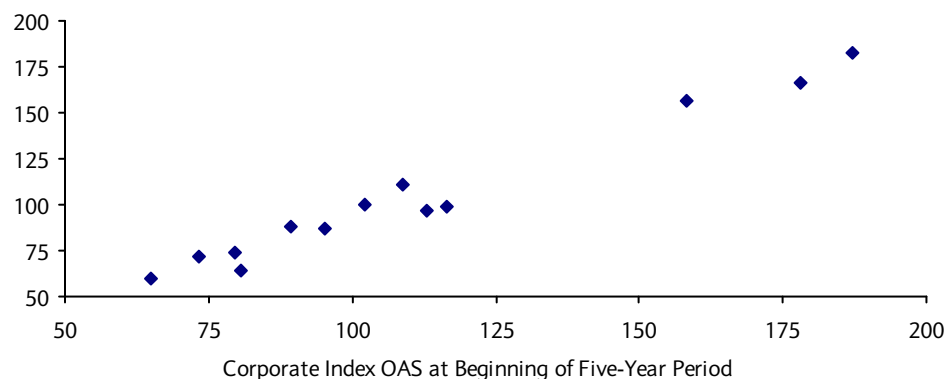
Source: Moody's and Barclays Capital

To get a sense of the volatility of the credit spread premium, we repeat the estimation exercise above but examine overlapping five-year periods from 1990 through 2005. We choose five-year periods because this interval lines up with the average duration of the index and because it covers an economic cycle. Results are presented in Figure 2. Some may be surprised that the corporate spread premium is consistently positive and consequential. In other words, corporate spreads are considerably and persistently larger than realized losses from default. In fact, this finding is often referred to as the “credit spread puzzle.”⁸ Considering that the average corporate bond market spread during this period was 130bp, spread premium accounted for over 91% of corporate spread levels.

Figure 3 shows that the credit spread premium is highly correlated with the market spread level at the beginning of the month. This is not too surprising. To the extent that spread levels are driven (positively) by changes in risk tolerance and liquidity cost, and assuming these are mean-reverting over a five-year period, then the realized spread premium would be highly correlated with the market spread level at the beginning of the period. Given the current (2/28/10) market OAS spread level of 172bp, if the historical relationship holds we would expect an annual spread premium of approximately 170bp/y over the next five years.

Figure 3: Relationship between OAS and Annual Credit Spread Premium Using Historical Default Data, Five-Year Periods, 1990-2005, in bp

Estimated Annual Excess Returns over Five-Year Periods
Based on Moody's Default & Recovery Data



Source: Moody's and Barclays Capital

⁸ As with the equity risk premium puzzle, there have been many suggested explanations for the “credit spread puzzle.” For example, realized defaults, so far, have been better than expected. However, the worse is still yet to come (Yikes!). Another explanation is that corporate coupon income is taxable at the state level whereas Treasury coupon income is not. A third explanation is that Treasury yields are artificially low due a liquidity premium, an effect that would exaggerate the credit spread puzzle. However, other studies have measured the credit spread premium using swap rates as the pricing benchmark and still find a substantial credit spread premium. Also, the credit spread premium may be compensation for the fact that credit returns are asymmetrical, negatively skewed with substantial kurtosis, which are undesirable for investors.

2. Measuring the Credit Spread Premium Using Index Excess Returns Data

The historical default experience indicates that corporates have earned a significant spread premium over the past 20 years. This supports the case that investors should have a persistent allocation to IG credit as part of their fixed-income benchmark. Our goal here is to measure the credit spread premium for the IG Corporate Index another way, using reported index excess returns.

The Barclays Capital Family of Indices reports excess returns that equal the difference in total return between a bond and a portfolio of hypothetical par Treasury bonds (plus cash) that match the bond's key rate duration exposure.⁹ Unlike the credit spread premium calculated using the Moody's realized default loss data, the reported index excess returns include a market spread change component, in addition to a default loss component. Figure 4 shows the one-year reported index excess returns for the IG Corporate, High Yield Index, and the Fixed-Rate MBS indices.

Figure 4: Annual Reported Index Excess Returns for the IG Corporate, High Yield, and Fixed-Rate MBS Indices; 1990-2009, in %

Year	IG Corporate Index	High Yield Index	MBS Index
1990	-1.93	-5.94	1.25
1991	2.72	20.08	0.13
1992	1.17	5.91	-1.11
1993	0.86	7.55	-1.04
1994	0.53	2.49	0.93
1995	1.36	0.66	-0.49
1996	1.14	8.26	0.83
1997	0.18	3.81	1.30
1998	-2.25	-8.43	-0.90
1999	1.47	4.82	1.13
2000	-5.27	-18.87	-0.77
2001	2.72	-2.85	-0.75
2002	-2.45	-13.29	1.73
2003	5.80	26.42	0.11
2004	1.63	8.00	1.42
2005	-1.15	0.47	-0.37
2006	1.26	8.42	1.22
2007	-5.22	-7.73	-1.85
2008	-19.88	-38.32	-2.55
2009	22.76	59.55	4.82
Average (in bp/y)	27	305	25
Annual standard deviation (in bp)	741	1,916	161

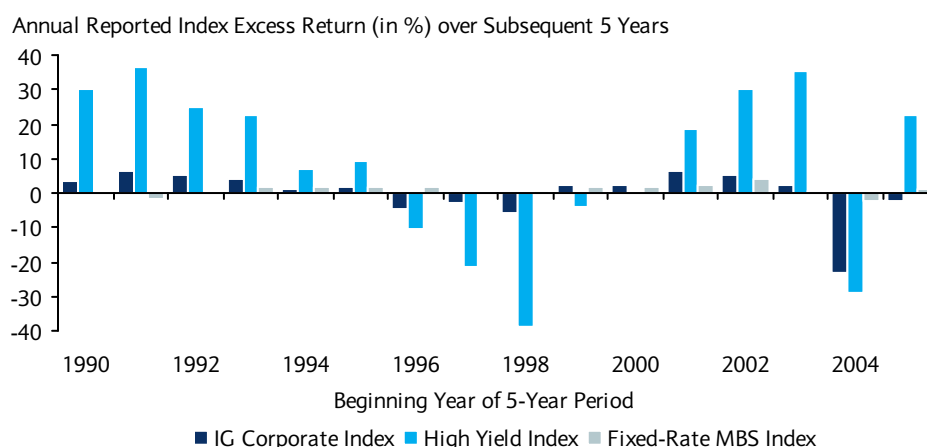
Source: Barclays Capital

⁹ In January 2001 Barclays Capital changed its index excess return method from a "duration bucketing" approach to the current "key-rate duration" approach. Although there are important differences between these methods, the results of the paper are not sensitive to the particular method used.

Over the past 20 years, the IG Corporate Index has averaged 27bp/y of annual reported index excess returns, compared to 305bp/y for the High Yield Index and 25bp/y for the MBS Index. Given the amount of spread volatility experienced by these asset classes, it is not surprising that their reported index excess returns are so volatile, producing low annual information ratios for the IG Corporate (0.04), High Yield (0.15), and MBS (0.15) indices.

Figure 5 shows the average annual reported index excess returns over five-year periods, for the IG Corporate Index. We measure five-year index excess returns by first calculating the annual compounded excess return over the next five years, and then averaging these annual returns.

Figure 5: Average Annual Reported Index Excess Returns, IG Corporate, High Yield, and Fixed-Rate MBS Indices, Five-Year Periods, 1990-2005, in %



Source: Barclays Capital

Over five-year periods, index excess returns are still volatile and can be significantly negative (five of the 15 overlapping five-year periods). During these negative periods investors are often left wondering whether credit offers any positive spread premium and question the inclusion of credit in their benchmark.

Reported index excess returns show much more volatility than the estimated spread premium using historical default loss experience as reported in Figure 2. The reason for this is that index excess returns include a spread-widening/tightening component that is missing from the estimated spread premium using default losses alone. Investors with a persistent allocation and the ability to hold bonds through economic cycles implicitly try to ride out any transient spread widening/tightening and hold bonds to maturity. Consequently, to use index data to estimate the spread premium we need to neutralize the spread component of reported index excess returns. To do so, we add back to the reported index excess return the annual change in index OAS multiplied by the average OASD for the year. For example, in 1995 the OAS of the index tightened by 14.5bp. With an average OASD over the year of 5.53, we estimate that 80bp of excess return stemmed from spread tightening. We subtract this from the reported index excess return of 136bp to compute an estimated realized credit spread premium of 56bp. We report the estimated annual spread premium calculated using index data in Figure 6.

Figure 6: Estimated Average Annual Spread Premium Using Index Data, IG Corporate, High Yield, and Fixed-Rate MBS Indices, 1990-2009, in %

Year	IG Corporate Index	High Yield Index	MBS Index
1990	0.74	7.84	2.69
1991	0.43	7.59	-0.51
1992	0.22	1.08	-0.84
1993	0.01	4.28	-0.54
1994	0.88	3.04	-0.89
1995	0.56	3.54	-0.79
1996	0.70	3.18	0.85
1997	0.74	3.86	0.71
1998	0.70	2.97	0.12
1999	1.25	1.04	0.26
2000	-0.22	-2.46	0.68
2001	1.27	-7.00	-1.49
2002	-1.93	-7.63	0.98
2003	0.40	4.48	-0.01
2004	0.79	3.16	1.23
2005	-0.08	2.86	0.54
2006	0.57	5.38	0.56
2007	1.49	5.22	-0.10
2008	2.16	9.76	-0.72
2009	-1.05	16.09	1.58
Average (in bp/y)	48	341	22
Annual standard deviation (in bp)	88	525	100

Source: Barclays Capital

The average annual credit spread premium in Figure 6 is loosely comparable (48bp/y versus 27bp/y) to the average annual reported index excess return over the past 20 years. This is not too surprising as spreads have exhibited mean-reverting behavior over time. The annual realized spread premium can be negative for all three asset classes. For the IG Corporate Index, there were four years in which the credit spread premium was negative – 2000, 2002, 2005 and 2009 – reflecting periods of credit-quality stress and a number of downgraded bonds.

As expected, removing the spread change component, the annual volatility of the realized spread premium is much lower (80% lower) than that of the reported index excess returns. The large drop in excess return volatility produces much higher annual information ratios for the IG Corporate (0.54) and High Yield (0.65), but much less so for MBS (0.22).

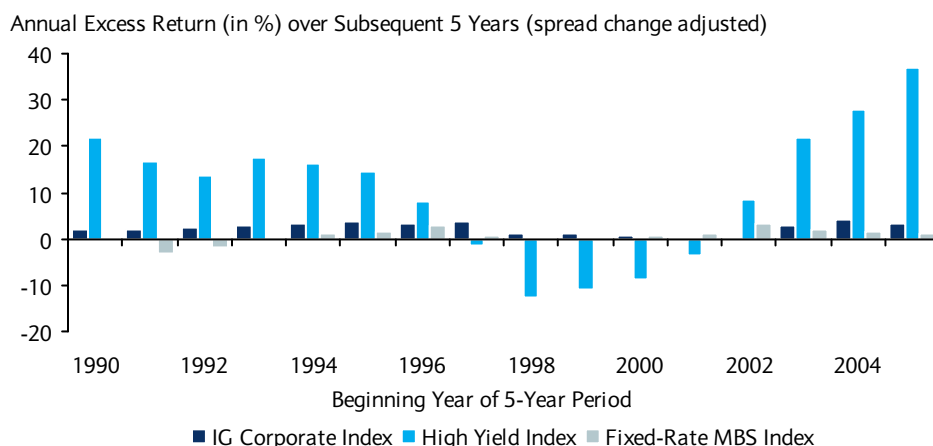
MBS often competes with IG Corporates in fixed-income portfolio allocation. In terms of reported index excess returns (Figure 4) MBS compared very favorably to IG Corporates as it had a similar average reported index excess return but much lower volatility. Interestingly, fixed-rate Agency MBS do not compare nearly as well to corporates once the monthly spread volatility is factored out. Although fixed-rate Agency MBS are unlikely ever to suffer default losses, MBS investors earn a spread premium for unexpected prepayment losses that is comparable in effect to a default loss. Figure 6 shows that after adjusting for spread changes, MBS have a lower spread premium (22bp/y) than IG Corporates (48bp/y) with a higher annual volatility (100bp vs 88bp). Compared with credit bonds, removing the spread volatility impact for the MBS Index produced a relatively smaller difference in annual spread premium volatility (100bp) compared with index excess return volatility (161bp). In addition, there was

also a negligible difference between the average MBS spread premium and the reported average MBS index excess return.

There are a couple of explanations for the lackluster showing of MBS in Figure 6. First, MBS spreads are not nearly as volatile as corporate spreads, so removing the spread change component from reported index excess returns will have a smaller impact on the volatility of MBS annual spread premium than would be the case for corporates. Second, the mechanism to adjust reported index excess returns to a spread premium for MBS is likely to be far less accurate than for corporates. For MBS, due to periodic prepayment and term structure model changes, there can be large changes in spreads that are unrelated to MBS reported index excess return performance. In addition, to make the spread adjustment we multiply the spread change by the average duration during the period which, given the volatility of MBS durations, is likely to be a far less accurate adjustment procedure for MBS than for corporates. All in all, the spread premium results for MBS cannot be compared directly against those for credit bonds.¹⁰

Figure 7 shows the annual spread premium for the IG Corporate Index over five-year overlapping periods. For IG and MBS, at least, there are no five-year periods with negative average annual spread premium. In contrast, High Yield suffered through five consecutive years where the average annual spread premium was negative over a five-year period (1997-2001). This period must have been very discouraging for long-horizon high yield investors who were trying to see through the spread volatility.

Figure 7: Estimated Average Annual Spread Premium Using Index Data, IG Corporate, High Yield, and Fixed-Rate MBS Indices, Five-Year Periods, 1990-2005



Source: Barclays Capital

Figure 8 compares the two methods of estimating spread premium. As shown, spread premium calculated using adjusted index excess returns for the IG Corporate Index are substantially less than the levels estimated using historical default loss data. For 12 of the 16 five-year (overlapping) periods since 1990, the IG Corporate Index has produced a credit spread premium estimated using reported index excess return data that averaged 52bp/y less than the estimated spread premium estimated with Moody's historical data.

¹⁰ For a more detailed analysis on the buy-and-hold performance for MBS, see: "MBS Investing over Long Horizons," Y. Chen and B. Phelps, Chapter 21 in *Quantitative Management of Bond Portfolios*.

Figure 8: Comparison of Annual Credit Spread Premium Estimates for IG Corporate Index, Five-Year Periods, 1990-2005, in bp

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Estimated Credit Spread Premium Using Historical Default Loss Experience	100	157	111	88	72	74	60	46	49	99	97	186	166	183	87	65
Estimated Credit Spread Premium Using Spread Adjusted Index Excess Returns Data	46	42	47	58	72	79	63	75	21	15	6	9	-5	64	99	62
Difference	55	115	64	30	0	-5	-3	-29	27	84	91	177	171	119	-11	3

Source: Moody's and Barclays Capital

The Credit Spread Premium Shortfall of the IG Corporate Index

The credit spread premium modelled with Moody's data is only a rough estimate and is not meant as an absolute obtainable target. Also, the two spread premium estimation methods are not expected to always agree. However, the persistent relative shortfall of the index's spread premium measured using reported index excess returns raises a question: Why the discrepancy?

Estimating spread premium using historical default data implicitly assumes the investor has a buy-and-hold portfolio. The set of bonds held in the investor's portfolio does not change except for defaults. As investors know, the IG Corporate Index is not a static buy-and-hold set of bonds. Figure 9 provides a snapshot of the Corporate Index at two times (December 31, 1989, and February 28, 2010). The index's composition is constantly changing as a result of new issuance and maturities over time, and as a result of the index inclusion rules. The impact of the index's rules is reflected in the index's reported excess returns. Is it possible that structural features of the index might be constricting its realized spread premium? If so, if we relaxed some of these rules, how much improvement might there be in the realized spread premium?

Beyond new issuance and maturities, three particular index rules have a significant impact on the index's composition over time. First, the index removes (at the end of the month and at the trader's bid-side price) any issue that is downgraded below investment grade; second, issues are removed if their remaining maturity is less than one year; and third, issues are removed if their amount outstanding falls below the index's liquidity requirement, which is periodically revised upward (currently 250mn).

Figure 9: Attributes of the IG Corporate Index, December 31, 1989, and February 28, 2010

	Market Value %										
	Avg OAD	Avg OAS	# issues	# tickers	Index Liquidity Constraint	Avg Issue Size	Avg Maturity (in yrs)	Aaa	Aa	A	Baa
12/31/1989	4.76	100	3,826	~ 750	25mn	119mn	12.9	10%	26%	39%	25%
2/28/2010	6.35	172	3,376	561	250mn	707mn	10.2	1%	16%	45%	38%
Average over period	5.62	131				364mn	11.4	4%	17%	46%	33%

Source: Barclays Capital

There are some *a priori* reasons why these index rules may be constricting the realized spread premium. As portfolio constraints are loosened or removed, their performance is likely to improve. Indices, like portfolios, are no exception. Consider the index's downgrade rule: Bonds downgraded below investment grade are removed from the index at the end of the downgrade month. It is very likely that when the bond is removed it leaves the index at a much wider spread than when it entered – after all, the bond has been downgraded. In addition, the bond may be trading at a wider spread than is justified by the bond's new rating because of increased credit uncertainty about the bond arising from its rating transition. Another more likely explanation might be that the large group of institutional investors forced to sell the bond now must sufficiently entice the relatively small group of high yield investors to add the new name to their portfolios. This has two implications for the index's spread premium. First, since the bond is no longer part of the index, the bond does not participate in the spread adjustment when calculating the Corporate Index's spread premium using index data as the bond's spread-widening is not added back. Second, most downgraded bonds end up maturing as scheduled.¹¹ Consequently, the spread premium realized by these bonds up until their maturity is not captured by the IG Corporate Index.

Removing bonds with less than one year to maturity may also constrict the index's credit spread premium. Bonds with less than a year to maturity are very seasoned bonds that may trade at wider spread levels to compensate investors for their lower liquidity.¹² So, when these bonds are sold out of the index, they leave at a wider bid-ask spread, and likely at a lower bid price, suggesting that there is a lot of credit spread premium built into the bond when it is sold. Although not usually required to do so, investors have less incentive to hold onto these bonds because they are not part of the index and because they offer relatively low nominal spreads relative to longer duration bonds of the same issuer. Although there are other homes for such short duration bonds, the fact that such bonds have little attention from institutional IG investors may cause these bonds to be sold from the index at particularly wide spreads.¹³

Finally, the index revises from time to time the minimum amount outstanding constraint (also called the "liquidity constraint"). For example, in early 1990 the liquidity constraint for the Corporate Index was 25mn, but today the constraint is 250mn. When the constraint is increased, all bonds currently in the index that are below the constraint threshold are sold out *en masse* from the index. Contrary to when the bonds were first included in the index, these relatively small bonds now trade at a spread concession to larger index bonds from their relative illiquidity.¹⁴ This cheapening and forced sale may result in a drag on the index's realized spread premium.

Alternative Corporate Indices

To measure the impact of index rules on the realization of the credit spread premium, we go back to December 31, 1989, to construct some alternative corporate indices using the identical index machinery and prices as the IG Corporate Index, while removing one or more of the IG Corporate Index rules. Specifically, we consider five alternative corporate indices:

¹¹ See: "Issuer-Capped and Downgrade-Tolerant U.S. Corporate Indices." Op cit.

¹² Our liquidity cost score (LCSSM) analysis shows that a bond's bid-ask spread widens as the bond ages.

¹³ Researchers have shown that short maturity bonds typically have relatively large credit spread premium. See: Elton, et al. Also, "Risk-Adjusted Performance of Short versus Long Duration Credit Portfolios," L. Dynkin, J. Mann and B. Phelps, June 11, 2001, Lehman Brothers Fixed Income Research.

¹⁴ We know from liquidity cost scores that currently a bond's spread is expected to widen 0.43bp per \$100mn reduction in its amount outstanding. See S. Dastidar and B. Phelps, "Introducing LCS: Liquidity Cost Scores for US Credit Bonds," 6 October 2009, Barclays Capital.

1. Downgrade Tolerant

Bonds in the IG Corporate Index downgraded below investment grade are allowed to remain in the index until they default, have one year or less remaining to maturity, or violate the index liquidity constraint.

2. Remaining Maturity Tolerant

Bonds in the IG Corporate Index with less than one year to maturity are allowed to remain in the index until they are downgraded below investment grade or violate the liquidity constraint.

3. Liquidity Constraint Tolerant

Bonds in the IG Index that violate the liquidity constraint (presently 250mn) are allowed to remain in the index until they are either downgraded below investment grade or have one year or less remaining to maturity.

4. IG-Only Fully Tolerant

This alternative version incorporates both 2 & 3 above. Bonds that violate the index's maturity and/or liquidity rules are allowed to remain in the index. However, this index holds only investment grade bonds, so bonds downgraded to high yield are sold out of the index.

5. Fully Tolerant

The downgrade, liquidity and remaining maturity rules are all lifted.

Figure 10 presents summary statistics for each of the five alternative corporate indices, as well as the standard IG Corporate and High Yield indices, as of February 28, 2010. (The figure also includes data for two composite indices that will be discussed later.) Compared to the IG Corporate Index, the alternative indices have more issues and issuers (i.e., tickers), reflecting that downgraded, small-sized and short-maturity bonds can remain in the various alternative indices. Both the Downgrade Tolerant and Fully Tolerant indices have some exposure to the high yield sector, currently at 6% of their total market value, which is more heavily skewed to Ba-rated issues compared to the High Yield Index. It is important to note that the current characteristics of these alternative corporate indices are a function of their December 31, 1989, inception date. For example, the present composition of high yield bonds in the Downgrade Tolerant Index depends on when the index started accepting downgraded investment grade bonds.

Figure 10: Description of Alternative Corporate Indices, as of February 28, 2010

Alternative Corporate Indices							Composite Indices		
	IG Corporate Index	Downgrade Tolerant Corporate Index	Remaining Maturity Tolerant Corporate Index	Liquidity Constraint Tolerant Corporate Index	IG-Only Fully Tolerant Corporate Index	Fully Tolerant Corporate Index	High Yield Index	IG-HY Composite Index	IG-BB Composite Index
OAD	6.35	6.28	6.04	6.38	6.06	5.99	4.28	6.24	6.30
OAS	1.73	1.96	1.72	1.73	1.72	1.95	6.51	1.99	1.85
# issues	3,376	3,662	3,562	4,385	4,660	5,056	1,674	5,050	4,003
# tickers	561	654	571	623	630	747	772	1299	770
Aaa	1%	1%	1%	1%	1%	1%	0%	1%	1%
Aa	16%	15%	16%	16%	16%	15%	0%	15%	16%
A	46%	43%	46%	45%	46%	43%	0%	43%	44%
Baa	37%	35%	37%	38%	38%	36%	0%	35%	36%
Ba	0%	4%	0%	0%	0%	4%	37%	2%	4%
B	0%	1%	0%	0%	0%	1%	37%	2%	0%
Caa	0%	1%	0%	0%	0%	1%	25%	1%	0%

Source: Barclays Capital

Our task is to measure the realized credit spread premium for the alternative indices and compare them to the IG Corporate Index. For this, we estimate the spread premium using reported index excess returns adjusted for spread changes. We follow the same procedure as before: For each index, we take the annual reported index excess returns and add back the impact of spread changes. Figure 11 shows the results.

Figure 11: Estimated Annual Credit Spread Premium Using Index Data, Alternative and Traditional Corporate Indices, 1990-2009, in %/y

Alternative Corporate Indices						
Year	IG Corporate Index	Downgrade Tolerant Corporate Index	Remaining Maturity Tolerant Corporate Index	Liquidity Constraint Tolerant Corporate Index	IG-Only Fully Tolerant Corporate Index	Fully Tolerant Corporate Index
1990	0.74	1.11	0.83	0.86	0.83	1.06
1991	0.43	1.06	0.44	0.43	0.44	1.03
1992	0.22	0.34	0.22	0.14	0.14	0.24
1993	0.01	-0.04	-0.07	0.07	0.00	-0.04
1994	0.88	1.06	0.92	0.89	0.93	1.07
1995	0.56	0.76	0.53	0.55	0.53	0.70
1996	0.70	0.78	0.69	0.73	0.72	0.80
1997	0.74	0.83	0.72	0.74	0.72	0.80
1998	0.70	0.79	0.66	0.70	0.67	0.75
1999	1.25	1.33	1.14	1.34	1.21	1.30
2000	-0.22	0.26	-0.16	-0.10	-0.04	0.30

Alternative Corporate Indices						
Year	IG Corporate Index	Downgrade Tolerant Corporate Index	Remaining Maturity Tolerant Corporate Index	Liquidity Constraint Tolerant Corporate Index	IG-Only Fully Tolerant Corporate Index	Fully Tolerant Corporate Index
2001	1.27	1.73	1.27	1.29	1.30	1.73
2002	-1.93	-1.02	-1.69	-1.72	-1.49	-0.71
2003	0.40	0.83	0.53	0.50	0.63	1.11
2004	0.79	0.98	0.70	0.89	0.80	1.02
2005	-0.08	0.44	-0.22	0.05	-0.08	0.31
2006	0.57	1.08	0.64	0.56	0.58	1.07
2007	1.49	2.01	1.15	1.48	1.18	1.69
2008	2.16	2.37	2.77	2.24	2.83	2.94
2009	-1.05	-0.65	-0.86	-0.86	-0.65	-0.05
Average (in bp/y)	48	80	51	54	56	86
Annual standard deviation (in bp)	88	80	89	84	85	77

Source: Barclays Capital

The alternative corporate indices have higher annual average spread premium than the IG Corporate Index. For example, the Liquidity Constraint Tolerant Index had an annual realized spread premium of 54bp/y compared to the 48bp/y for the IG Corporate Index with similar volatility. Both the Remaining Maturity Tolerant and the IG-Only Tolerant Indices also have modest improvements in their realized spread premium compared to the IG Corporate Index (3bp/y and 8bp/y, respectively). Although these alternative indices slightly underperformed the IG Corporate Index in some years, generally they outperformed.¹⁵

The Downgrade Tolerant and Fully Tolerant Indices showed consistent outperformance versus the IG Corporate Index. Except for 1993, when both alternative indices underperformed the IG Corporate Index by 5bp, both alternatives have consistently outperformed. The average annual credit spread premium for the Downgrade Tolerant and Fully Tolerant alternatives was 80bp/y and 84bp/y, respectively, or 32bp/y and 38bp/y more than the IG Corporate Index. From 1990 to 2010, the Fully Tolerant Corporate Index captured 79% more credit spread premium than the IG Corporate Index. In addition, the volatility for both alternatives was lower than the IG Corporate Index. As a result, the annual information ratio improves from 0.54 for the IG Corporate Index to 1.00 and 1.11, respectively, for the Downgrade Tolerant and Fully Tolerant alternatives.

For an investor benchmarked against the US Aggregate with its 18% allocation to the Corporate Index, this magnitude of additional credit spread premium works out to approximately 6-7bp/y of potential additional Aggregate performance if the IG Corporate Index were replaced with one of these alternative corporate indices. Considering that the average alpha from fixed-income active management is approximately 44bp/y (before fees), the magnitude of the additional spread premium from the alternative indices is important.¹⁶

¹⁵ The Liquidity Constraint Tolerant Index and, indirectly, the IG-Only Fully Tolerant Index have spikes of outperformance versus the Corporate Index. This is because the liquidity constraint changes episodically: 1992, 1994, 1999, 2003 and 2004. In a year where the liquidity constraint is unchanged, then the spread premium performance of the Liquidity Constraint Tolerant and IG Corporate Index tends to be close to each other.

¹⁶ See: "Fixed Income Active Returns: Characteristics, Constraints and Competition," A. Desclée and B. Phelps, 26 February 2010, Barclays Capital. Performance data for 4Q1991-1Q2006.

Figure 12 shows the annual credit spread premium for the various corporate indices for five-year holding periods. In no five-year period did the Fully Tolerant Index underperform the IG Corporate Index. In a few periods, the IG-Only Fully Tolerant Index did underperform, but never by more than 2bp/y. The bottom row of the figure shows the additional annual credit spread premium earned by the Fully Tolerant Index, ranging from 8bp/y to 63bp/y for a given five-year period.

Figure 12: Estimated Annual Credit Spread Premium Using Index Data, Alternative and IG Corporate Indices, Five-Year Periods, 1990-2005, in bp/y

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
IG Corporate Index	46	42	47	58	72	79	63	75	21	15	6	9	-5	64	99	62
Downgrade Tolerant Corporate Index	71	64	58	68	84	89	80	99	62	63	56	59	46	107	138	105
Remaining Maturity Tolerant Corporate Index	47	41	46	56	71	75	61	73	24	22	13	12	-1	56	101	70
Liquidity Constraint Tolerant Corporate Index	48	42	48	60	72	81	68	79	30	26	17	20	6	69	104	69
IG-Only Fully Tolerant Corporate Index	47	41	46	58	71	77	66	77	33	32	24	23	9	62	106	77
Fully Tolerant Corporate Index	67	60	56	67	83	87	79	98	67	75	69	69	56	104	141	119
Credit Risk Premium pickup by Fully Tolerant Corporate Index	22	18	8	9	11	8	16	23	46	59	63	60	61	40	42	57

Source: Barclays Capital

We saw in Figure 6 that the High Yield Index also had greater spread premium than the IG Corporate Index. However, the annual volatility of the High Yield spread premium (525bp) was six times greater than that of the IG Corporate Index (88bp). What is impressive about the results for the alternative indices is that they are able to generate additional spread premium with no additional volatility.

Nevertheless, it is prudent to ask if the improvement for the alternative indices stems from increased risk. In other words, a skeptic could argue that the Fully Tolerant Index has earned a higher spread premium because an investor in that index was taking on more risk compared to the IG Corporate Index. To address this issue, Figure 13 shows various risk properties, in terms of reported index excess returns, for the traditional and alternative indices over the past 20 years. All five alternative corporate indices had very similar, if not better, risk profiles than the IG Corporate Index. For example, the Fully Tolerant Index had a standard deviation of monthly reported index excess returns of 118bp/m, equal to the IG Corporate Index. In terms of tail risk (e.g., worst cumulative reported index excess returns over a period, worst 5% of months, and worst month), the Fully Tolerant compared very favorably. The same holds for the other alternative indices.

Figure 13: Risk Properties, Alternative Corporate Indices, January 1990-February 2010

	IG Corporate Index	Alternative Corporate Indices					High Yield Index	IG-HY Composite Index	IG-BB Composite Index	MBS Index
		Downgrade Tolerant Corporate Index	Remaining Maturity Tolerant Corporate Index	Liquidity Constraint Tolerant Corporate Index	IG-Only Fully Tolerant Corporate Index	Fully Tolerant Corporate Index				
Average monthly reported index excess returns	2.2	4.1	2.5	2.6	2.9	4.7	18.0	3.1	2.7	2.2
Std dev of monthly reported index excess returns	118	126	112	117	111	118	297	125	120	38
Information Ratio (annual)	0.06	0.11	0.08	0.08	0.09	0.14	0.21	0.09	0.08	0.20
Kurtosis	17.4	15.6	17.9	17.3	17.6	15.9	7.7	15.9	16.5	2.3
Worst cumulative reported index excess returns over										
12-months	-2,249	-2,335	-2,136	-2,246	-2,120	-2,206	-4,138	-2,328	-2,268	-386
24-months	-2,695	-2,855	-2,541	-2,710	-2,539	-2,691	-4,736	-2,817	-2,732	-469
36-months	-2,600	-2,674	-2,450	-2,627	-2,458	-2,535	-4,083	-2,671	-2,614	-373
Reported index excess returns in worst 5% of months										
Average	-308	-331	-290	-307	-288	-309	-816	-330	-317	-97
Worst month's reported index excess returns	-838	-858	-806	-812	-776	-795	-1650	-840	-832	-163
Month	Sep-08	Sep-08	Sep-08	Sep-08	Sep-08	Sep-08	Oct-08	Sep-08	Sep-08	Oct-08

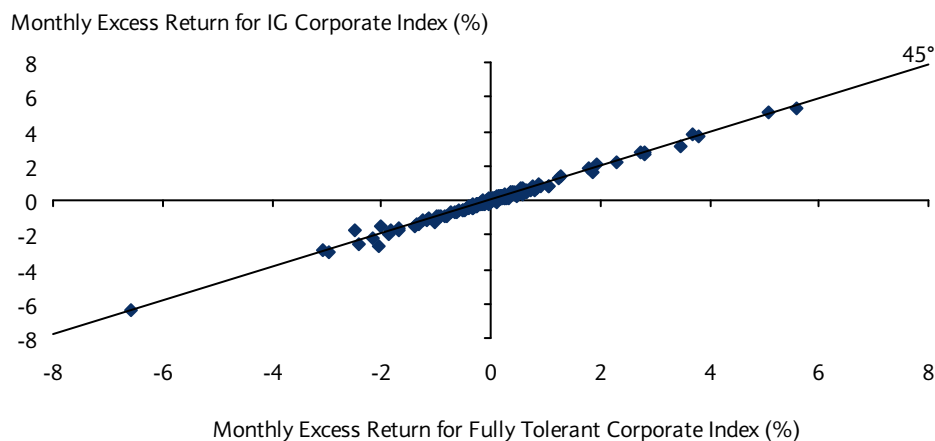
Source: Barclays Capital

Figure 14 plots the reported monthly index excess returns for the IG Corporate Index against those for the Fully Tolerant Index. This is another way to check for outliers or non-linearities. As the figure shows, the reported index excess returns for the two indices were highly correlated (correlation coefficient = 0.996).¹⁷ Noticeably, although the two sets of returns fall smartly along a line, the monthly reported index excess returns for the Fully Tolerant Corporate Index generally fall along a line with an angle slightly less than 45° relative to those for the IG Corporate Index, again highlighting the better performance of the Fully Tolerant Corporate Index.¹⁸

¹⁷ In addition, the correlations of reported monthly index excess returns for the Fully Tolerant Corporate Index with the MBS Index and the S&P500 (total returns) are virtually the same as for the IG Corporate Index. This is so for the entire 20 year period and also for the worst 5% of months for the IG Corporate Index.

¹⁸ Using OLS regression, the slope of the regression line is 0.99 with an intercept of -0.025, indicating the better performance of the Fully Tolerant Corporate Index relative to the IG Corporate Index.

Figure 14: Reported Monthly Index Excess Returns, Fully Tolerant and IG Corporate Indices, January 1990 to February 2010



Source: Barclays Capital

Others may argue that the higher realized spread premium for the Downgrade Tolerant and Fully Tolerant Indices is the result, in large part, of the presence of high yield bonds in those indices. If so, then why not just add high yield directly to the IG Corporate Index? Figure 13 shows that the risk properties (standard deviation and tail risk measures) of the High Yield Index are more than double those of the IG Corporate Index. Of course, the alternatives have only a small allocation to high yield. To permit a more “apples-to-apples” comparison, we construct two composite indices: The IG Corporate-High Yield Index Composite and the IG Corporate-High Yield BB-Only Composite. Each composite is constructed to mimic dynamically the allocation to high yield found in the Downgrade Tolerant Index. For example, if in a month the Downgrade Tolerant Index had an $x\%$ weight to high yield bonds, then for that month the IG-HY Composite would have a weighting of $(1-x\%)$ to the IG Corporate Index and $x\%$ to the High Yield Index. The IG-BB Composite is constructed slightly differently as we take the weight of the Downgrade Tolerant in BB-bonds only and ignore the rest (assuming an investor would not hold sub-BB bonds). We then form the composite by taking the proportional shares of IG and BB in the Downgrade Tolerant Index and then re-size those share weights as the weights for the IG-BB Composite Index.

Figure 10 above presents summary statistics for these two composite indices as of February 28, 2010. In terms of reported index excess returns, Figure 13 shows that the two IG-HY composites display risk behavior similar to that of the Downgrade Tolerant Index. However, the relative reported index excess return advantage of the Downgrade Tolerant Index persists. For example, the IG-HY Composite has an average monthly reported index excess return of 3.1bp/m compared to 4.1bp/m for the Downgrade Tolerant Index.

In terms of realized spread premium the IG-HY and IG-BB composite indices both produced a higher annual spread premium (68bp/y and 58bp/y, respectively) than the IG Corporate Index (48bp/y). They also did so with lower annual volatility (84bp and 86bp versus 88bp). However, the two composite indices clearly underperformed the Downgrade Tolerant Index both in terms of annual spread premium (88bp/y) and volatility (80bp). The intuition is that the IG Corporate Index suffers from the automatic selling of downgraded bonds at the end of their downgrade month. The risk premium and liquidity cost of these bonds spike in their downgrade month which is “paid” by the IG Corporate Index in the form of discarding considerable spread premium. On a proportional basis, the Downgrade Tolerant Index

captures more of this discarded spread premium than do the composites that hold predominantly high yield bonds that were never investment grade.

Figure 15: Estimated Annual Credit Spread Premium Using Index Data, Alternative, Composite and Traditional Corporate Indices, 1990-2009, in %/y

Year	Alternative Corporate Indices			Composite Indices	
	IG Corporate Index	Downgrade Tolerant Corporate Index	Fully Tolerant Corporate Index	Composite IG Corporate + HY Indices	Composite IG Corporate + HY BB-only Indices
1990	0.74	1.11	1.06	0.95	0.82
1991	0.43	1.06	1.03	0.96	0.80
1992	0.22	0.34	0.24	0.29	0.05
1993	0.01	-0.04	-0.04	-0.03	0.11
1994	0.88	1.06	1.07	1.12	0.99
1995	0.56	0.76	0.70	0.65	0.63
1996	0.70	0.78	0.80	0.85	0.82
1997	0.74	0.83	0.80	0.81	0.77
1998	0.70	0.79	0.75	0.76	0.71
1999	1.25	1.33	1.30	1.16	1.26
2000	-0.22	0.26	0.30	-0.30	-0.30
2001	1.27	1.73	1.73	1.35	1.43
2002	-1.93	-1.02	-0.71	-1.22	-1.81
2003	0.40	0.83	1.11	0.62	0.22
2004	0.79	0.98	1.02	0.81	0.90
2005	-0.08	0.44	0.31	0.31	0.37
2006	0.57	1.08	1.07	1.05	0.53
2007	1.49	2.01	1.69	1.87	1.73
2008	2.16	2.37	2.94	2.42	2.14
2009	-1.05	-0.65	-0.05	-0.87	-0.63
Average (in bp/y)	48	80	86	68	58
Annual standard deviation (in bp)	88	80	77	84	86

Source: Barclays Capital

Capturing Additional Credit Spread Premium: Adopting an Alternative Corporate Benchmark

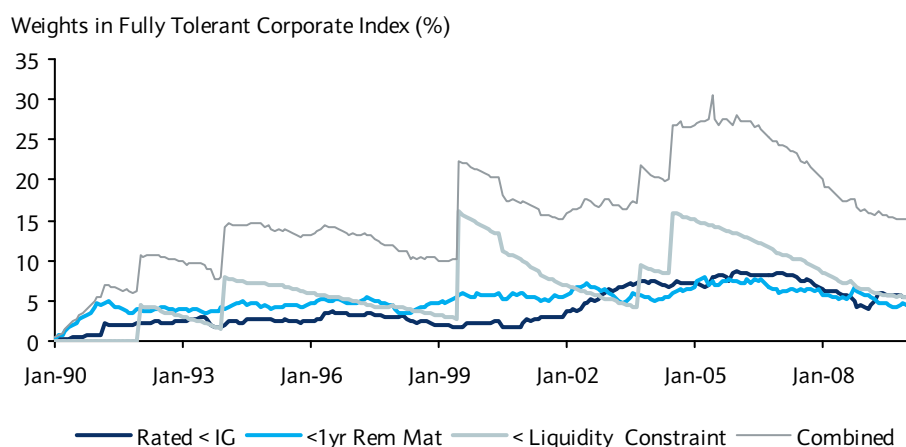
We now examine more closely two alternative corporate indices: The Fully Tolerant and IG-Only Fully Tolerant. Although the Fully Tolerant Index is the least constrained, and has the highest realized credit spread premium, it may be unacceptable to investors with hard requirements to avoid high yield bonds. The IG-Only Fully Tolerant Index tries to be as unconstrained as possible without ever holding a high yield bond at the beginning of a month.

Figures 16 and 17, respectively, show the market value percentage breakdown of bond types excluded from the IG Corporate Index that would remain in the Fully Tolerant and IG-Only Fully Tolerant indices. As of February 28, 2010, the Fully Tolerant Corporate Index contained approximately 15% of its market value in bonds that are excluded from the IG Corporate

Index. This 15% is roughly evenly distributed across downgraded (now high yield) bonds, small-issue-size bonds and bonds with remaining maturity of less than one year.

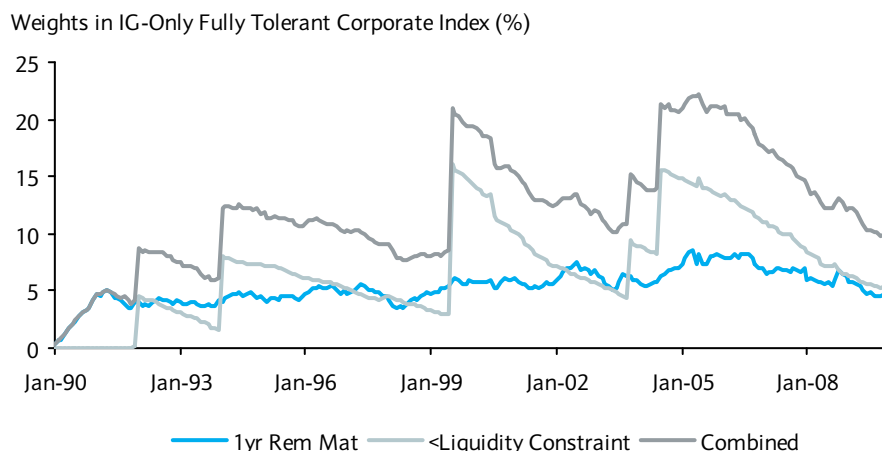
For the Fully Tolerant Index, the percentage of market value in high yield has been increasing over time, although it does wax and wane along with macroeconomic trends. The percentage in bonds with a remaining maturity of one year or less is very constant, at approximately 5%. This is to be expected as the short remaining lives of these bonds mean that they will not persist and accumulate in the Fully Tolerant Index and there is always a new supply the next year. The percentage of small-sized bonds is generally decreasing except when the Corporate Index liquidity constraint changes and there is a large spike in the market value weight of these bonds. For example, in July 1999, when the liquidity constraint increased from 100mn to 150mn, the percentage market value weight of small-sized bonds increased from about 3% to 16%. These spikes in market value arising from changes in the liquidity constraint caused the overall weight of “excluded” bonds to sometimes exceed 20%, at times approaching 30%, of the Fully Tolerant Index.

Figure 16: Composition of Fully Tolerant Corporate Index, January 1990-February 2010, in %



Source: Barclays Capital

Figure 17: Composition of IG-Only Fully Tolerant Corporate Index, January 1990-February 2010, in %



Source: Barclays Capital

How would an investor go about adopting either the Fully Tolerant or IG-Only Fully Tolerant Index as their credit benchmark? Unlike other Barclays Capital Indices, there is an element of time-dependence for these indices as their current composition depends on when the index rules were relaxed. For example, we commenced construction of the Fully Tolerant Index on December 31, 1989. From that date, any bond in the Corporate Index that was subsequently downgraded to high yield was eligible for the Fully Tolerant Index. We did not commence the Fully Tolerant Index with all existing high yield bonds, as of December 31, 1989, that were once in the IG Corporate Index.

The investor has some choices. He or she could select the Fully Tolerant Index that began on December 31, 1989. However, this would require the portfolio manager to find that 15% market value of the index that he or she does not currently hold. This may be difficult. Alternatively, the investor could adopt the Fully Tolerant Index *prospectively*. In other words, as of Date MM/DD/YYYY, the investor will relax the rules for the IG Corporate Index. When an investment grade bond is downgraded, the bond will not leave the index. There is no reason to believe that the portfolio manager is suddenly unable to evaluate the credit. In fact, this is a strong argument for adopting the Fully Tolerant Index: The portfolio manager who analyzed the bond when it was an investment grade credit is probably very qualified to continue evaluating the credit. Why throw away this expertise (not to mention selling the bond when it is plump with unrealized spread premium) just because the bond was downgraded? The manager is still at liberty to underweight the bond if that is his or her evaluation.

A prospective benchmark would have to be maintained separately by the Barclays Capital Family of Indices. Depending on the investor's start date, the Index Group would start calculating and publishing that "vintage" of the Fully Tolerant Index going forward.

Summary

Despite the high level of spread volatility, credit bonds have generated a substantial credit premium. On average, more than 90% of a bond's spread has been in excess of that needed to cover default losses. Investors willing to tolerate the spread volatility have the potential to harvest this credit spread premium over time.

However, to capture as much of this spread premium as possible investors need to ensure that their credit benchmark does not have rules that may inadvertently discard some of this spread premium. We show that the index inclusion rules for the Barclays Capital IG Corporate Index have constrained the ability of investors to capture a larger credit spread premium.

We propose some alternative credit benchmarks that would have allowed investors with a persistent credit allocation to capture a spread premium (86bp/y) almost 80% larger than that offered by the IG Corporate Index (48bp/y) without taking any additional risk.

For portfolio managers benchmarked against the IG Corporate Index, these results suggest a long-term strategy for benchmark outperformance. If managers have permission to hold on to bonds that the Corporate Index discards, managers should be able to harvest the additional spread premium and outperform the benchmark.

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