

Crossover: the credit sweet spot

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Fundamentals – ratings and leverage

p.09

At a glance

- The history of corporate bond markets resulted in a somewhat artificial boundary between investment grade (IG) and high yield (HY) bonds appealing to separate classes of investors.
- This boundary also created dislocations in an asset class that straddles both universes: the crossover segment of BBB to BB rated bonds.
- We believe this segment provides an interesting structural opportunity.
- From a risk-return perspective, crossover bonds significantly improve investment grade returns, but with similar risk, in our view.
- Valuations for crossover bonds tend to be much better than IG, with substantially higher spreads. “Fallen angels” are strong drivers of this excess valuation.
- The crossover segment tends to have similar risk to IG and significantly lower than HY. Crossover drawdowns and volatility are also more akin to IG than HY.
- As for issuer fundamentals, we argue that crossover issuers have a propensity to improve their fundamentals as corporations historically have preferred a deleveraging strategy when close to the IG-HY threshold.
- The crossover universe could serve as a replacement for IG strategies, owing to similar risk characteristics, sector distributions and ratings, in our view.
- Active investment grade managers tend to also follow a crossover-type strategy with a systematic over-exposure to credit and underweight to rates, indicative of an exposure to BB rated bonds at the expense of higher rated issuers.
- We believe that the combination of better valuations, improving fundamentals, low risk and diversification makes crossover the “sweet spot” of the credit spectrum.

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Crossover issuers tend to improve their fundamentals as corporations historically have preferred a deleveraging strategy when close to the IG-HY threshold.

Introduction

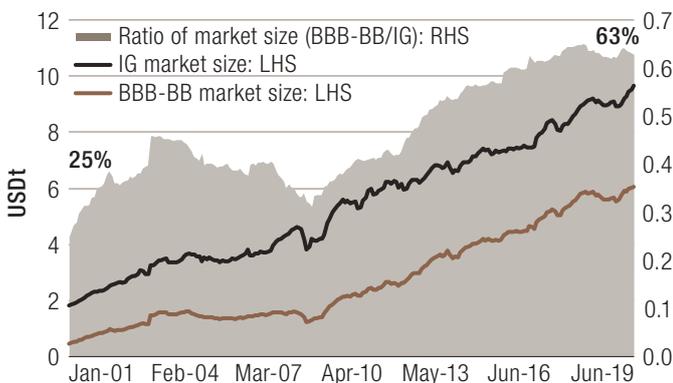
Investors have historically used corporate bonds to generate income in excess of risk-free treasuries with limited additional risk. This excess income, also known as the credit-spread premium¹ was achieved primarily by investing in investment grade (IG) corporate bonds. The rise of bond indexation, focused primarily on investment grade bonds gave further impetus to this trend. The very name “investment grade” implied that lower rated bonds were generally considered speculative, off-benchmark bets.

The first benchmark, the Lehman US Aggregate Index, was started in 1973 and constituted exclusively of investment grade bonds. High yield or speculative grade benchmarks began much later in the early 1990s following the popularity of “junk” bonds in the 1980s that often fuelled leveraged buyout (LBO) activity.

The history of corporate bond markets resulted in a somewhat artificial boundary between investment grade and high yield bonds that appealed to separate classes of investors. This boundary also created dislocations, which influenced both issuer behaviour as well as asset performance. We believe that these dislocations provide an interesting structural opportunity in an asset class that straddles both universes: the crossover or BBB-BB asset class.

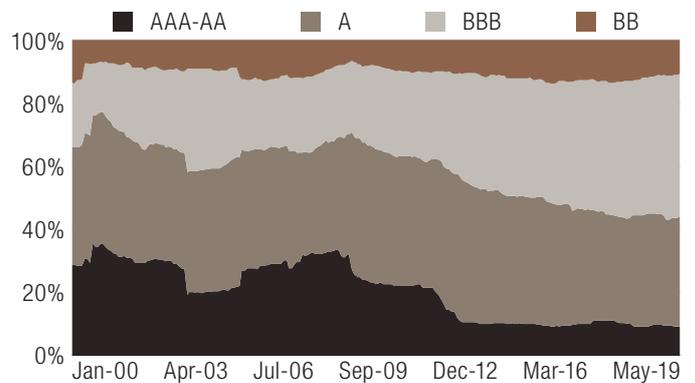
The crossover market is no longer a niche asset class, rising from less than 20% in 2001 to almost two-thirds of the size of the investment grade corporate market in 2018, as shown in Figure 1A. An increase in the BBB universe, as shown in Figure 1B, is a significant driver of this growth.

FIG. 1A MARKET VALUE CROSSOVER VERSUS IG



Source: Bloomberg, LOIM Calculations.

FIG. 1B COMPOSITION OF AAA-BB UNIVERSE BY RATING BUCKETS

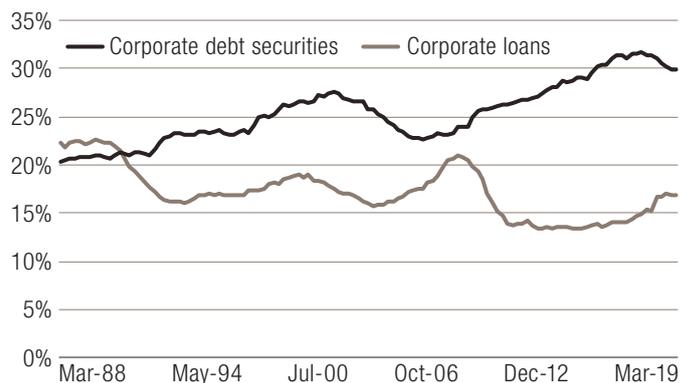


Source: LOIM, Bloomberg Barclays Indices.

This increase in BBB-rated issuance is not due to BBB corporates leveraging, but rather a result of the effects set in motion by the global financial crisis of 2008-09 that led to the disintermediation of banks as lenders. We have previously discussed this in our white paper about corporate leverage.²

Using US data, we find a substantial reduction in loans,³ as shown in Figure 2, as banks de-risked after the crisis. Interestingly, a similar disintermediation pattern was seen in the early 1990s following the saving and loans crisis.

FIG. 2 US CORPORATE DEBT-TO-GDP SPLIT BY COMPONENT



Source: Bloomberg, LOIM Calculations.

¹ There is extensive literature indicating that credit risk premium is positive, indicating a statistically significant positive return net of defaults or even structural model implied numbers. Liquidity (Bao, 2011; Longstaff, 2005; Helwege, 2014), Contagion (Colin-Dufresne, 2010), Jump-to-Default (Driessen, 2005) are alternative explanations for this phenomena.

² Please see LOIM paper entitled: Assessing corporate leverage trends. We analyse corporate leverage and downgrade rates over the past 30 years in the US and show that the corporate sector is no more vulnerable than it has been historically, and the rise of BBB's is not due to the leveraging patterns of corporates.

³ Although loans can also be provided by the capital markets, such as seen in the rise of the leveraged loans industry, loans are largely provided by banks and dominated by smaller, private companies.

Smaller corporations that would have traditionally used bank loans as a source of funding moved into public markets by issuing corporate bonds. Figure 3B shows a decrease in the size of companies issuing corporate bonds, as measured by their equity market-capitalization, relative to the average equity market-cap. These corporations tend to be BBB-rated and have been one of the major drivers of the increase in size of the BBB universe.

The downgrade of financials and issuance of more subordinated and bail-able⁴ debt by banks further fuelled the proliferation of BBBs. Figure 3A shows that the average rating of financials has declined by nearly two notches (from A+ to A-) over the past 20 years. While this trend has made the overall financial system more stable, it also led to a general deterioration in ratings⁵ in this sector.

FIG. 3A AVERAGE RATING¹ OF US FINANCIALS SECTOR

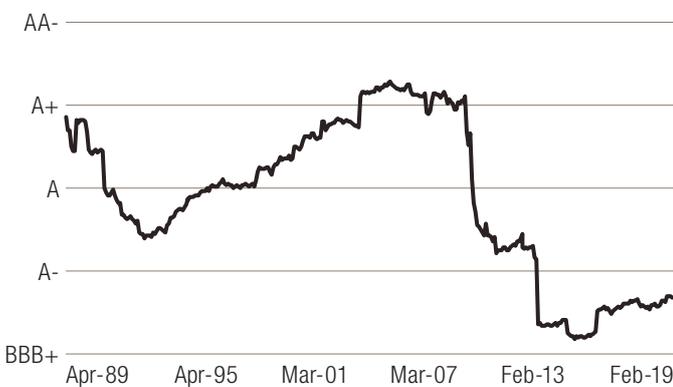


FIG. 3B SIZE RATIO (BY EQUITY MARKET-CAP) OF COMPANIES WITHIN THE BOND VERSUS EQUITY UNIVERSE²



Source: LOIM calculations, Bloomberg Barclays indices, Factset, Worldscope.

Regulatory pressures – will the segregation persist?

While the crossover investment universe has increased substantially, many investors still do not straddle the two universes for various reasons, including expertise and regulations.

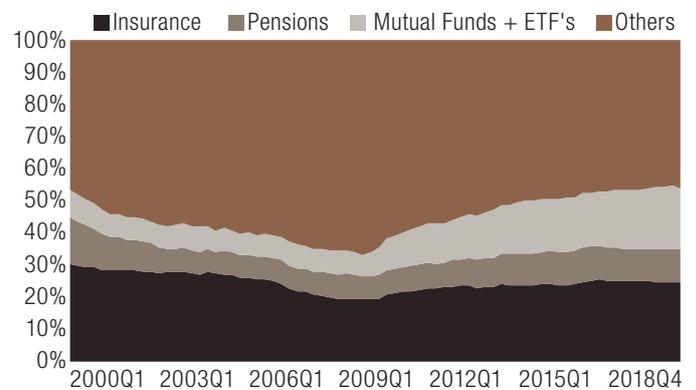
⁴ Currently, nearly all of a bank's capital structure is bail-able allowing the continued survival of the bank in distress periods or an orderly resolution in case of a failure. AT1, LT2's and Senior non-preferred debt are categories of debt that can be bailed-in in the event of distress.

⁵ Duffie (2018) asserts that for mitigating systematic failure, creditors would need to believe that they would experience a significant loss at solvency. This effect has manifested itself in lower ratings and higher spreads for banks despite a stronger balance sheet via the issuance of bailable debt.

Murray & Nikolova (2018) show that bonds with a high propensity to downgrade to non-investment grade (BBB-) outperform other IG bonds on a risk-adjusted basis. The authors argue that selling pressure from insurance companies – who hold over a quarter of the outstanding corporate bonds universe in the US as seen in Figure 4A – is one reason for this outperformance. Figure 4B shows that capital charges for insurance companies increase by 3.5x for a single notch downgrade from BBB- to BB+.

Regulatory pressures driving underperformance of highly-rated bonds is also addressed by Becker & Ivashina (2011), while forced selling resulting in outperformance of downgraded bonds is documented by Ellul & Lundblad (2011) and Ben Dor & Xu (2011).

FIG. 4A OWNERSHIP OF US CORPORATE BONDS



Source: St Louis Federal Reserve, LOIM Calculations.

FIG. 4B CAPITAL CHARGES FOR INSURANCE COMPANIES

	GRADE	DESIGNATION	REQUIRED CAPITAL LIFE	CHARGE P&C
A- and above	IG	1	0.40%	0.30%
BBB+ to BBB-	IG	2	1.30%	1.00%
BB+ to BB-	NIG	3	4.60%	2.00%
B+ to B-	NIG	4	10.00%	1.50%
CCC to CCC-	NIG	5	23.00%	10.00%
CC, C, D	NIG	6	30.00%	30.00%

Source: St Louis Federal Reserve, LOIM Calculations.

In the next section, we analyse the risk-return trade off within the crossover and the overall corporate bond universe. We show that crossover bonds provide a significant improvement to investment grade from a returns perspective with similar risk. We also look at the trend in the fundamentals of issuers and show that crossover issuers tend to improve their fundamentals as corporations prefer a deleveraging strategy when close to the IG-HY threshold. We believe that the combination of better valuations, improving fundamentals, low risk and diversification makes crossover the “sweet spot” of the credit spectrum.

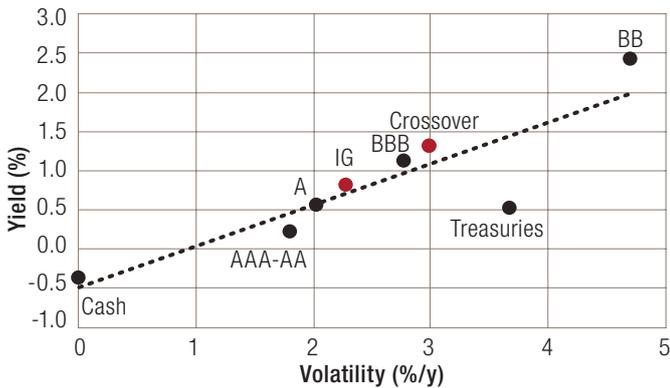
Crossover risk-return dynamics

Valuation and return characteristics

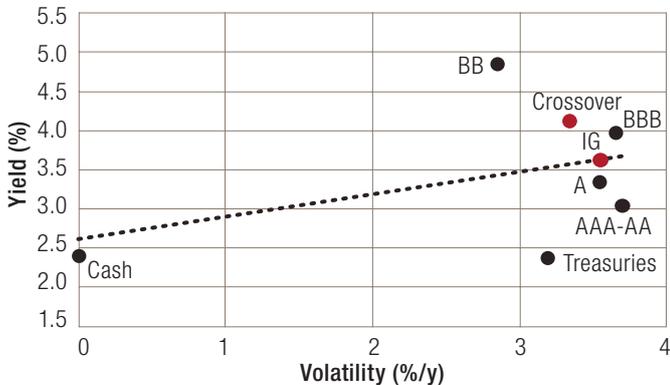
A natural starting point to assess credit securities is to analyse the risk-return trade-off across assets. Forward-looking return in fixed income is often proxied by yield or carry. In Figure 5 we plot the yield versus ex-ante volatility for USD and EUR denominated bonds. The scatter plots show the favourable position that crossover holds in this spectrum in both the US and Europe. Crossover bonds have higher yields than IG largely because of higher spreads but with comparable or even lower volatility. In fact, within the US universe, the volatility is actually at a lower level than that of IG. This is due to lower durations, as well as the greater diversification benefit between rate and credit risk seen in the crossover universe.

FIG. 5 YIELD VERSUS VOLATILITY

A – EURO UNIVERSE



B – US UNIVERSE



Source: Bloomberg Barclays Indices, LOIM calculations. As at 29 March 2019. Yields are in local currency, unhedged. Past performance is not a guarantee of future returns. Yields are subject to change and can vary over time.

While a snapshot of yield and ex-ante volatilities is useful as a tactical basis for investing in crossover, we also look at longer-term returns and risk.

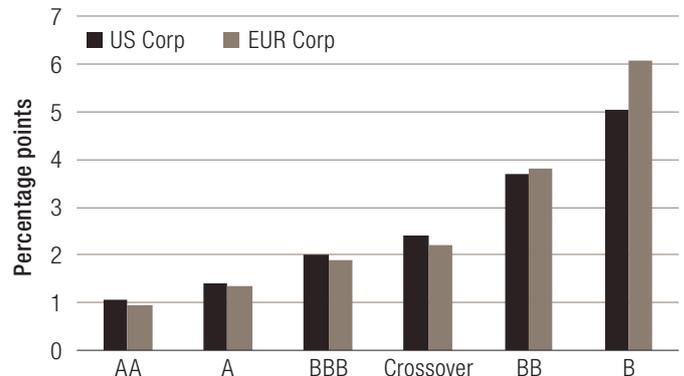
A key component of the improved return profile of crossover comes from the exposure to BBs, as is illustrated in Figure 6.

In Figure 6A, we report the average spread over treasuries of corporate bonds by rating category since 2004. Indeed corporate bond spreads are monotonically related to ratings as credit risk increases in lower rated categories. Figure 6B plots credit excess returns since 2004 for the US and EUR corporate universe.⁶ Credit excess return isolates the return purely attributable to credit spreads by stripping out the treasury component from total returns, and therefore allows for a better comparison across rating categories. A crucial difference between credit excess returns and spreads is that credit excess returns take into account losses from default and downgrades as well as potential benefits from credit roll-down.

In line with credit spreads, credit excess return increases lower down the rating spectrum as the credit risk premium is higher for riskier bonds. However, surprisingly, BB bonds outperform B bonds despite spreads that are 40% lower. For yield-targeted investors, excess return per unit of spread is often a relevant metric. Figure 6C shows that excess returns per unit of spread is significantly higher for BB rated issuers followed by BBB and B issuers.⁷

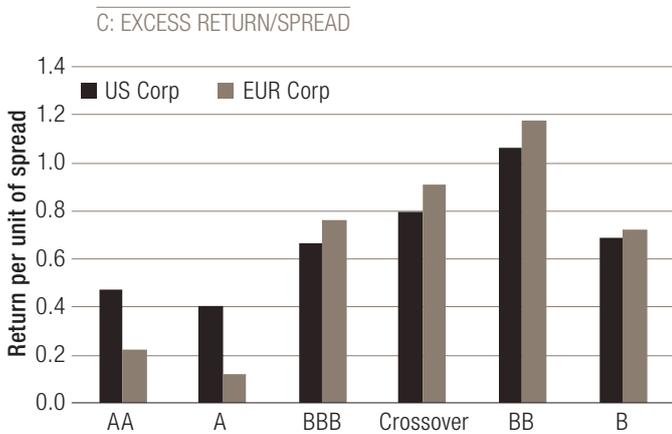
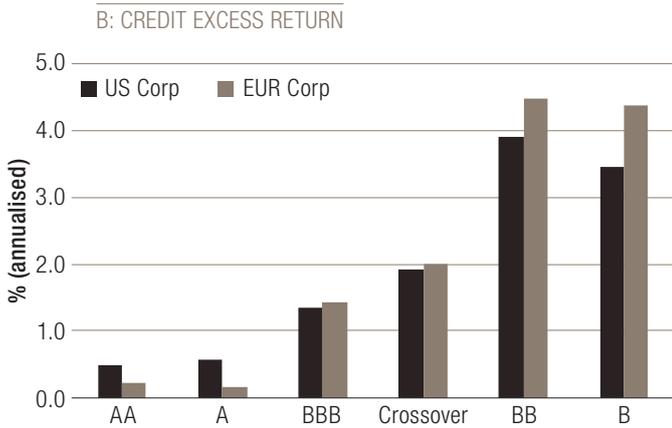
FIG. 6 CREDIT ANALYTICS BY RATING CATEGORY (2004-2019)

A: SPREADS



⁶ We use data since 2004 to get a sufficiently populated universe for US and EUR bonds in all rating categories. Similar conclusions persist if we extend the analysis for the US since 1990.

⁷ We observe an unusual effect of credit returns being actually higher than credit spreads for BB bonds. This is largely from a positive roll-down and rising stars that more than compensate for downgrade losses.

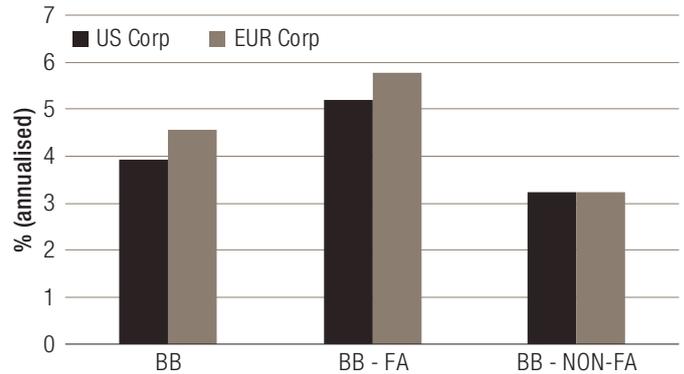


Source: Bloomberg Barclays Indices, LOIM Calculations. Past performance is not a guarantee of future results.

Whilst a multitude of factors contribute to the outperformance of BBs both in absolute returns and relative to their spreads, a dominant driver is the outperformance of bonds from companies downgraded from IG, also known as fallen angels. Fallen angels persistently exhibit a significant valuation discount for their fundamentals, with forced sellers shifting demand-supply dynamics and causing negative price overreactions.

Figure 7 shows the positive effect fallen angels have on BB returns. BB bonds that have been downgraded from higher rated categories (BB-FA) substantially outperform bonds issued as BBs (BB-NON FA). Ellul & Lundblad (2011) and Ben Dor & Xu (2011) show that the outperformance of fallen angels is due to price pressure upon downgrade as investment grade investors rush to sell bonds that are no longer index eligible. Ben Dor (2011) also show that this phenomena is stronger when the supply of fallen angels is significant and HY bond funds are less able to absorb

FIG. 7 CREDIT SPREAD RETURNS SPLIT BY FA AND NON-FA



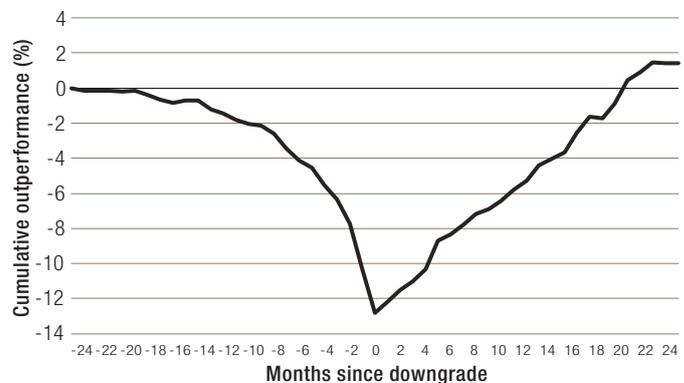
Source: Bloomberg Barclays Indices, LOIM Calculations.

this additional supply in what is likely to be a negative environment for credit. Fallen angels, while still risky, slowly recover over a few years as bonds pull-to-par.

In Figure 8, we consider the credit excess performance of fallen angel bonds⁸ over the past 30 years in the US relative to their peer group⁹ by month since downgrade. We use as the peer group the market-weighted index of bonds with the rating into which the fallen angel was downgraded. For example, a fallen angel that is downgraded into the BB+ rating category is compared to the index of BB+ bonds for two years before and after the downgrade month.

The figure shows that fallen angels begin underperforming almost a year before the downgrade month with almost 12% cumulative underperformance by the downgrade month itself. Post downgrade however, there appears to be a slow reversion over the next 24 months with a reversal of all of the underperformance as corporations reduce leverage and the bonds pull-to-par.¹⁰

FIG. 8 FALLEN ANGELS CUMULATIVE OUTPERFORMANCE OVER PEER GROUP: 1989 – 2019 (DOWNGRADE IN MONTH 0)



Source: Bloomberg Barclays Indices, LOIM Calculations. Past performance is not a guarantee of future results.

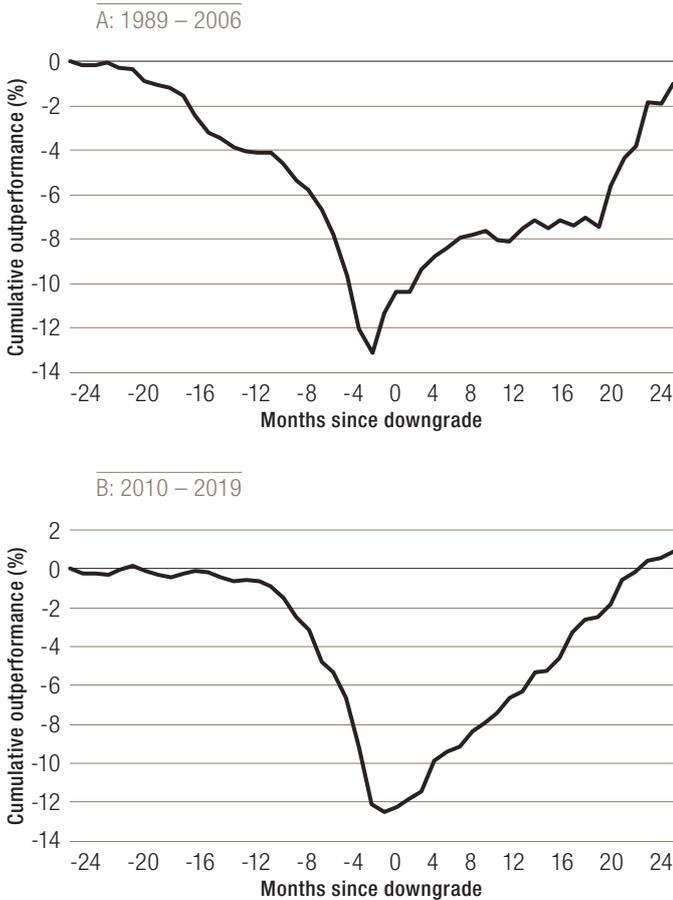
⁸ We focus on fallen angels that downgrade to BB rating consistent with Figure 7.

⁹ We use a peer group of sector and post-downgrade rating matched bonds.

¹⁰ We do not claim that fallen angels improve their fundamentals more rapidly or are less risky than their peer group. From a rating perspective, fallen angels are more likely to downgrade than their peers as downgrades tend to have momentum. This is a manifestation of a valuation shock that reverses as bonds pull-to-par.

Indeed, a number of phenomena in credit markets are biased by the financial crisis of 2008. We therefore remove this outlier by focusing on the 1989 – 2006 and 2010 – 2019 periods in Figure 9. The pattern observed is remarkably similar in both periods, with a cumulative underperformance of 12-14% by the downgrade month and a recovery over the next 24 months indicating a robust effect that has persisted for at least 30 years.

FIG. 9 **FALLEN ANGELS CUMULATIVE PERFORMANCE RELATIVE TO PEERS (DOWNGRADE IN MONTH 0)**

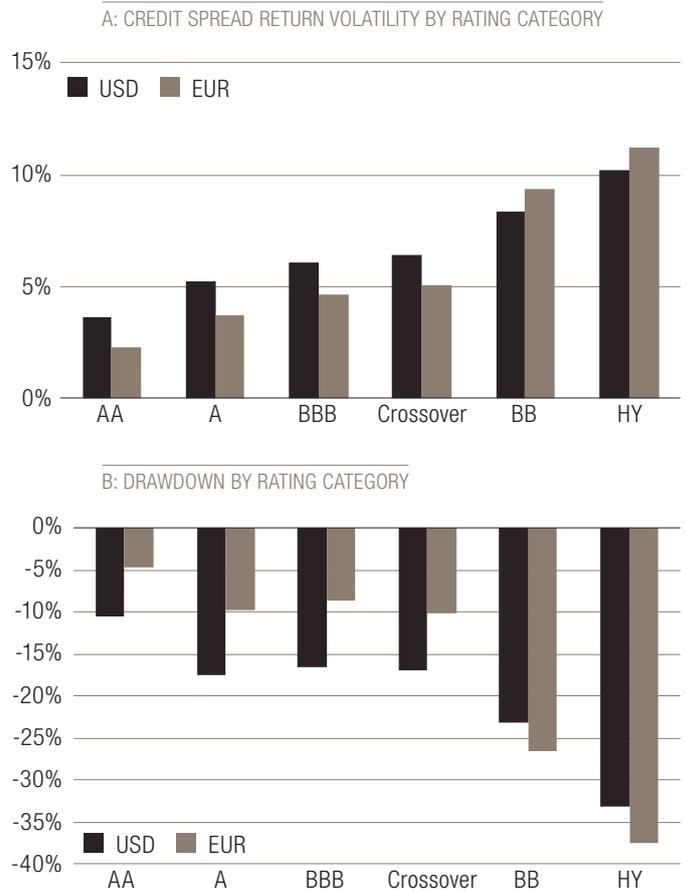


Source: Bloomberg Barclays indices, LOIM Calculations. Past performance is not a guarantee of future results.

Risk characteristics

While the crossover universe has substantially better return characteristics than investment grade, the mark-to-market risk profile of crossover is more aligned with the investment grade end of the spectrum than high yield. This is indeed extremely favourable, as Figure 10 shows that there is a significant pick up in volatility and drawdown for a move lower down the rating spectrum into high yield. Even the lowest risk spectrum of the HY universe, BB bonds, have risk and drawdowns that are 50% higher than crossover.

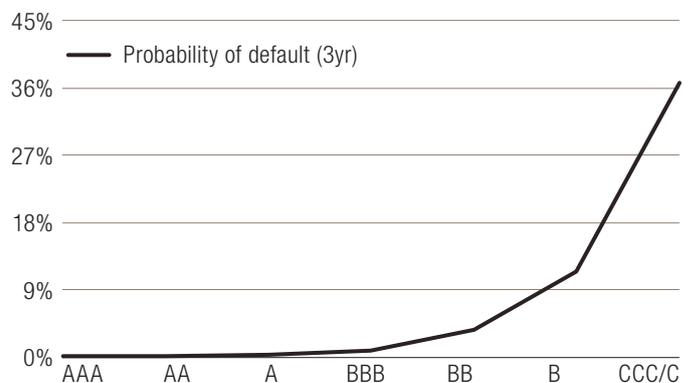
FIG. 10 **MTM RISK – VOLATILITY AND DRAWDOWN (JUNE 2004 TO FEBRUARY 2019)**



Source: Bloomberg Barclays indices, LOIM Calculations.

Mark-to-market risk measures might be less relevant for long-term buy-and-hold investors. Therefore, in Figure 11, we also plot the 3-year default rates by rating category. Default risk is very contained up to the BB rating category, rising exponentially at B and below.

FIG. 11 **DEFAULT RISK BY RATING CATEGORY**

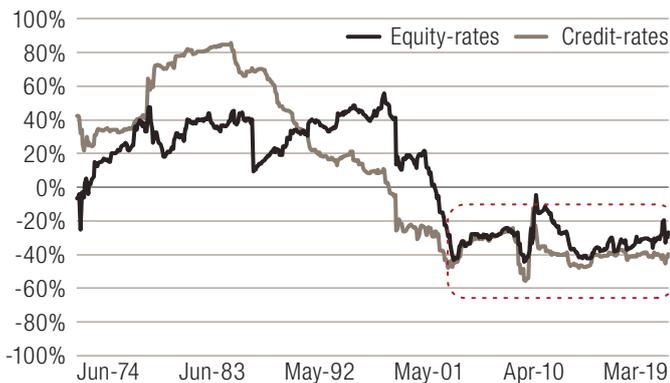


Source: Standard & Poors, LOIM calculations. Average three-year transition rates for Global Corporate from 1981 to 2016. "2016 Annual Global Corporate Default Study and Rating Transitions," Standard & Poor's, May 2017.

Diversification

While the focus of the previous sections was on credit excess returns, corporate bonds also include a substantial rate return component. It is common knowledge that an exposure to rates tends to diversify risky exposures such as credit and equities owing to the “risk-off” nature of duration.¹¹ This relationship, while robust over the last 15 years, was very different in the high inflation regimes of the past and especially during the stagflationary 1970s.¹² Ilmanen (2003), argue that when shocks are driven by inflation then the rate-equity correlation is likely to be positive; whereas in a low-inflation, growth shock, rate exposures are a diversifier. Given today’s low inflation environment, the current diversifying property of rate exposures is likely to persist.

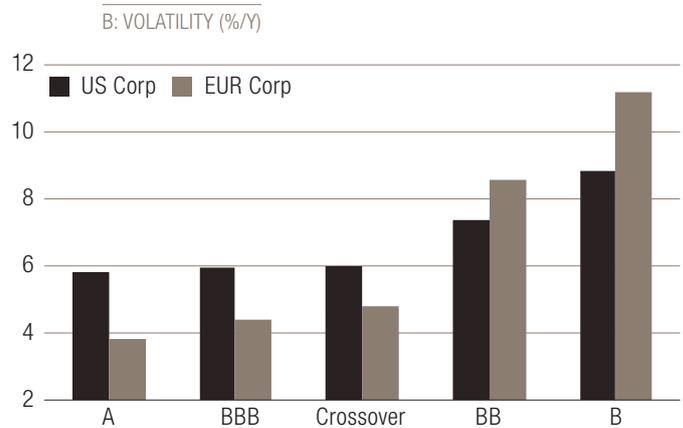
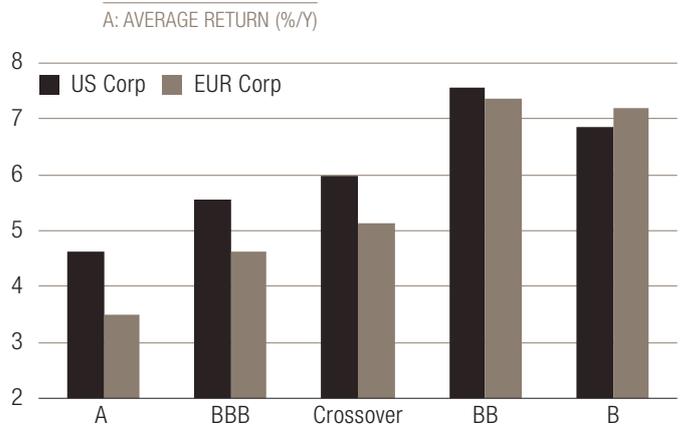
FIG. 12 TIME-WEIGHTED CORRELATION BETWEEN US RATES AND US EQUITY/US CREDIT: 1974 - 2019



Source: Equity returns from S&P 500 Total Return index, bond and credit returns from Bloomberg Barclays indices. Time-weighted correlations calculated using a 24-month half life.

A negative rate-credit correlation has been especially beneficial if we look at the risk-returns of crossover when compared to both IG and HY universes in total returns (Figure 13). The returns of the crossover universe have been better than higher rated assets but with similar volatility. The volatility of crossover is substantially lower than BB or lower rated assets.

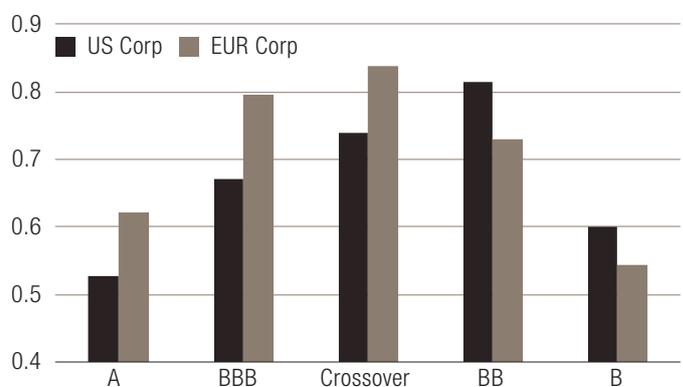
FIG. 13 TOTAL RETURN STATISTICS BY RATING CATEGORY: 2004 – 2019



Source: Bloomberg Barclays indices, LOIM Calculations. Past performance is not a guarantee of future results.

This diversification between rate and credit results in better Sharpe ratios for the crossover asset class (Figure 14).

FIG. 14 SHARPE RATIO: 2004 – 2019



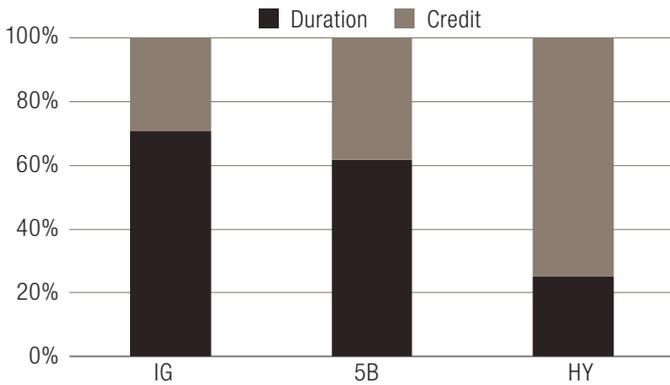
Source: Bloomberg Barclays indices, LOIM Calculations, LOIM Calculations.

¹¹ Duration is considered a diversifier to equity and credit risk through expectations of a rate cut from central banks in response to growth shocks.

¹² In an inflationary environment such as the 1970s and 1980s, both rates and equities are affected by the discount rate. See - Ilmanen, A. (2003). Stock-bond correlations. The Journal of Fixed Income, 13(2), 55-66.

While the effects of diversification are clear from the previous charts, we also look at a snapshot of the current mix between rate and credit risk using an ex-ante risk model in Figure 15. Investment grade bonds are dominated by rate risk while HY bonds by credit risk, with crossover bonds showing a better balance of the two risks.

FIG. 15 DURATION AND CREDIT RISK CONTRIBUTIONS – GLOBAL CORPORATE BONDS



Source: Bloomberg Barclays indices, LOIM Calculations, LOIM Calculations.

In the previous sections, we showed that the risk-adjusted performance of crossover is substantially better than IG but with similar risk characteristics. A significant part of the outperformance is from a valuation shock as bonds are downgraded from IG to HY. This over-reaction of fallen angels, most of whom recover subsequently, is a key driver of the outperformance of BBs even when compared to higher yielding B issuers. A demand-driven valuation shock, however, is not the only reason we consider the crossover segment a credit sweet spot.

In the next section, we argue that the artificial boundary between investment grade and high yield has very real effects on the behaviour of issuers on the IG-HY cusp. We find that crossover issuers tend to improve their credit fundamentals over time, which is in stark contrast with other rating categories.

Fundamentals – ratings and leverage

The seminal work of Robert Merton (1974)¹³ models equity as being long a call option on the assets of the firm and corporate debt as being short a put option on the assets of the firm. This feature creates a very crucial difference between corporate bond and equities that leads to differing incentives for equity and debt holders. Equity holders, as effectively the holder of a lottery, have a greater incentive to make the firm riskier. Corporate debt holders, on the other hand, have an incentive to make the firm less risky as it reduces the value of the put and therefore increases the value of the bond.¹⁴

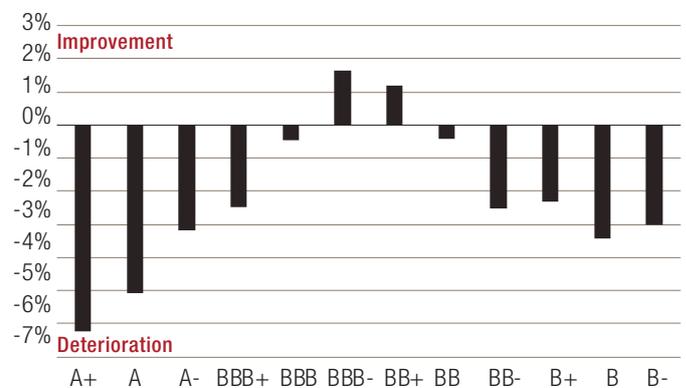
This problem is often stated as the “asset-substitution” problem in which value can be transferred between shareholders and debt holders. Firms can be made more risky by increasing leverage to finance more speculative projects. In studies of optimal capital structure such as Leland (1994),¹⁵ it is often assumed that equity holders have control¹⁶ over the firm and suggests that debt covenants and shortening the debt maturity can help alleviate the asset-substitution problem.

We argue that debt holders increasingly exercise control by de-risking the business¹⁷ and reducing leverage as it moves closer to the IG-HY rating threshold. This is consistent with Fan & Sundaresan (2000) who propose a bargaining exercise between debt and equity holders in a restructuring scenario which the equity holders prefer to leverage up while debt holders prefer a deleveraging strategy.¹⁸

The BBB-BB rating category also constitutes relatively large companies that avoid the jump-to-default and liquidity concerns seen in the B and lower segment. Figure 16 calculates net annualized downgrade rates (upgrade less downgrade notches) over the past 30 years. Indeed corporations in general tend to worsen in quality following Schumpeter’s idea of creative destruction.¹⁹ However, there is significant variation across rating categories.

In Figure 16, we see that highly rated companies (A or better) as well as low rated companies (B and lower) tend to have a high propensity to downgrade. BBB and BB rated bonds, however, improve their ratings as evidenced by a positive net upgrade rate. Fundamentals tend to improve the most at the IG-HY threshold for BBB- and BB+ bonds.

FIG. 16 ANNUAL UPGRADE RATE (%) LESS DOWNGRADE RATE (%) FROM MOODY’S



Source: LOIM calculations. Moody's Annual Default Study: Corporate Default and Recovery Rates, 1920-2017.

The patterns in Figure 16 can be explained by higher rated corporations preferring to leverage as equity holders have a greater sway in the financial policy of the company. For very low rated companies (B and below), survival becomes a greater issue as these companies can easily jump-to-default. However, in the sweet spot of BBB-BB ratings, companies show both a preference as well as an ability to deleverage. Deleveraging companies tend

¹³ Merton, R. (1974). On the Pricing of Corporate Debt: the Risk Structure of Interest Rates. *Journal of Finance*, 29(2), 449-470.

¹⁴ The Merton model assumes that the value of the firm is invariant to the capital structure in line with Modigliani-Miller (1958). Therefore, there is no “optimal” capital structure for the firm. This assumption has been relaxed in papers such as Leland (1994, 1996) who also calculate an optimal capital structure in the presence of bankruptcy costs and taxes.

¹⁵ Leland, H. (1994). Corporate Debt Value, Bond Covenants, and Optimal Capital Structure. *Journal of Finance*, 49(4), 1213-1252. Here they assume a static model in which equity holders determine an equity value maximizing leverage level.

¹⁶ It is assumed that the equity holder determines the default boundary at a level that maximizes equity value and therefore influences capital structure decisions.

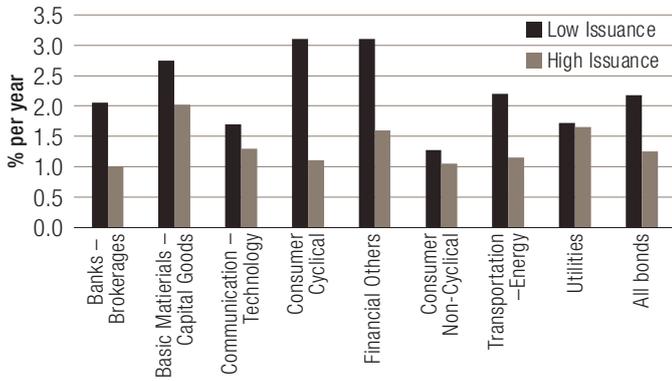
¹⁷ Covenants is a direct mechanism to exercise control.

¹⁸ This is consistent with Fan & Sundaresan (2000) who propose a bargaining exercise between debt and equity holders in a restructuring scenario which the equity holders prefer to leverage up while debt holders prefer a deleveraging strategy. This bargaining exercise is likely to play out whenever there is a debt rollover similar to the dynamic model proposed by Titman & Tsyplakov (2007).

¹⁹ Schumpeter, Joseph A., *The Theory of Economic Development*. New York: Oxford University Press, 1934.

to outperform leveraging companies, from a credit perspective, within all sectors, as shown in Figure 17.

FIG. 17 PERFORMANCE OF US SECTOR PORTFOLIOS PARTITIONED BY ISSUANCE RATE (JAN 1994 – JAN 2018)

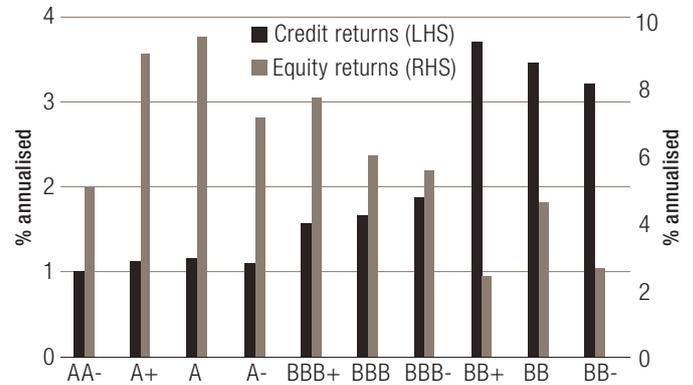


Source: Factset, Worldscope, LOIM Calculations.

Figure 18 shows the leverage preferences of corporations, where we calculate the average credit return for corporate bonds and contrast it with the total returns for equities by rating category. Equity performance peaks for companies rated A, declining as companies are downgraded to BBB and below.²⁰ This pattern is consistent with the equity literature, for example Dichev (1998) and Campbell et al (2008), who find that credit risk is not priced into equity performance.²¹ The performance pattern of equities is a stark contrast to the performance patterns of corporate bonds, which peak at BB ratings. BB rated equities are the worst performing equity cohort, indicating that corporations prefer a

deleveraging strategy over growth with debt-holders exercising greater control in favour of equity holders.

FIG. 18: PERFORMANCE OF US NON-FINANCIALS CORPORATE BONDS VERSUS EQUITIES BY RATINGS: 2002 – 2018



Source: Factset, Worldscope, LOIM calculations.

The rationale presented here sets a capital structure argument for the performance patterns to remain. Crossover issuers should tend to improve fundamentals as equity holders reduce their influence on the firm’s leverage policy. Improving leverage dynamics, we believe, are a key structural reason for the improved risk-adjusted performance of crossover issuers over the long term.

²⁰ Equity performance again improves at BB- rating which is potentially due to the size/value factor or distress risk getting priced into equity valuations. Vassalou and Xing (2004) show that the size and value effects exist largely in segments with high distress risk.

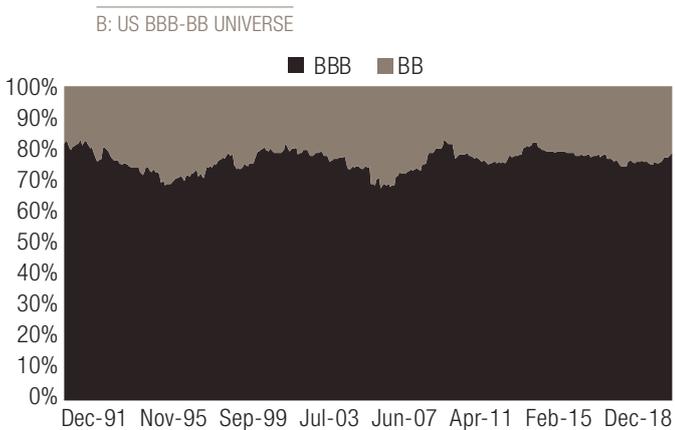
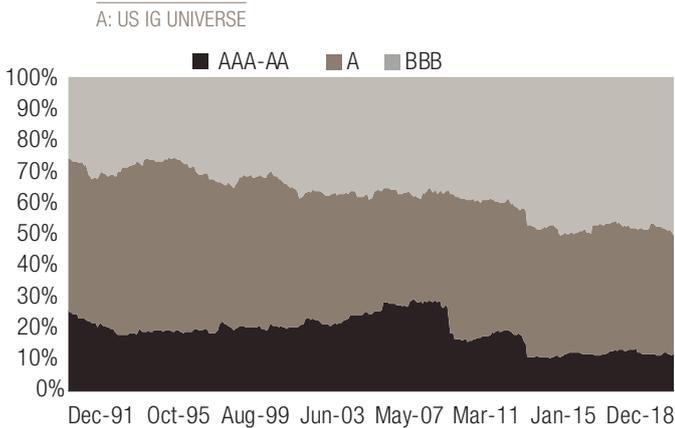
²¹ Dichev (1998) uses an Altman’s (1968) metric for credit risk estimation and Campbell et al. (2008) uses a structural model. Both authors find that distressed companies generate anomalously low returns.

Similarities with IG – risk and systematic exposure

In previous sections, we established the structural benefits of crossover from a performance and fundamentals perspective. In this section, we analyse the similarities between IG and crossover on the risk and systematic exposure dimension.

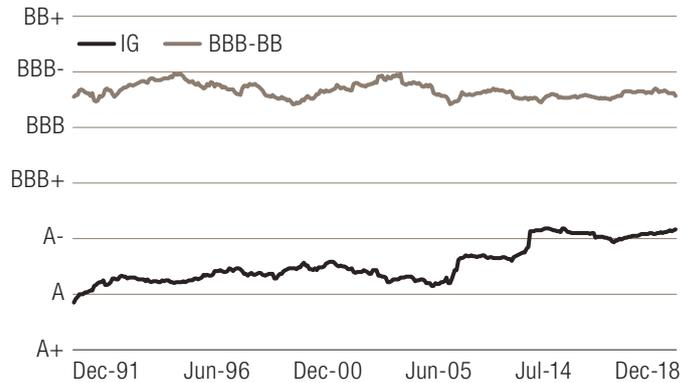
The credit rating of a bond is one indicator of long-term risk. We show that crossover bonds tend to have low default risks as seen in Figure 11. We also find that while the crossover universe has been broadly stable in its rating mix with a stable allocation of BBBs versus BBs, the IG universe has declined in credit quality. The proliferation of BBBs and the relative decline of the AA and higher rated segment of the bond universe has resulted in a general deterioration in ratings within the IG universe. This rating deterioration within IG has resulted in a convergence in quality to the stable crossover universe.

FIG.19 MOODY'S RATING MIX²²



Source: LOIM calculations, Bloomberg Barclays Indices.

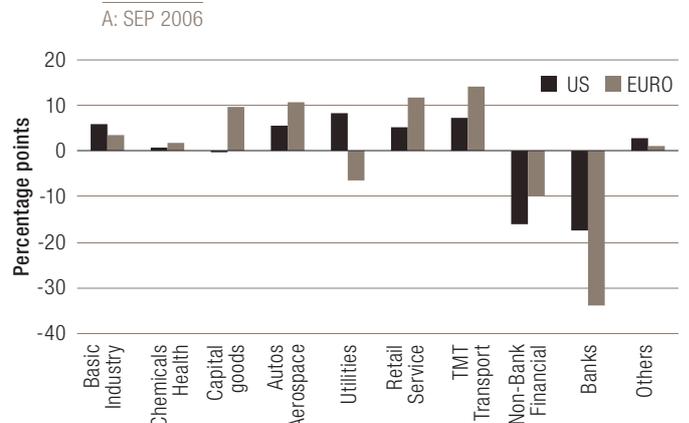
FIG. 20 AVERAGE MOODY'S RATING OF THE US IG AND US BBB-BB UNIVERSE



Source: LOIM calculations, Bloomberg Barclays Indices.

An additional risk dimension for corporate bonds is the sector mix. Indeed the crossover sector can have a different sector mix than IG and this can drive differences in performance and risk characteristics. Research from Barclays²³ shows that sector risks are more dominant than regional risks both for mark-to-market risk metrics or from the perspective of rating downgrades.²⁴ Figure 21 shows that the sector mismatch was very significant prior to the crisis with a substantial overweight in crossover versus the IG universe in the financial and utility sectors and underweight in the transportation sector (effect of Ford/GM). Currently the sector mismatch is much lower, indicating similar sector effects in both universes.

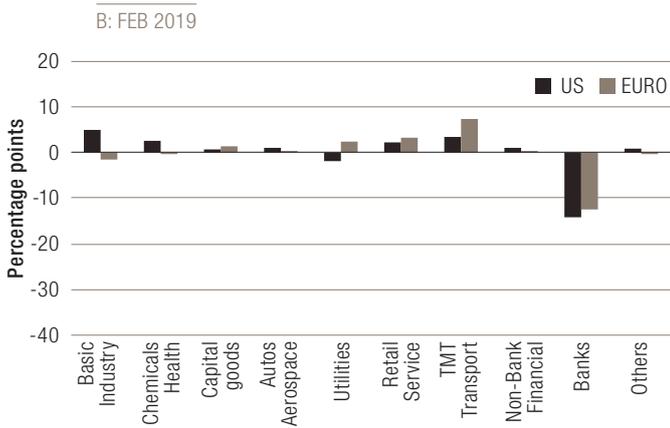
FIG. 21 SECTOR MISMATCH BETWEEN BBB-BB AND IG UNIVERSES



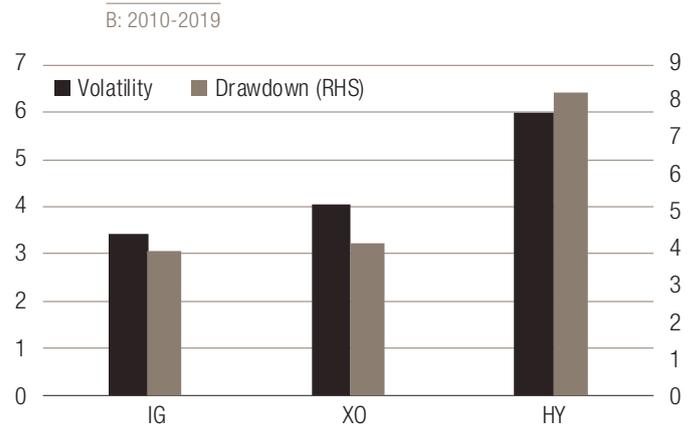
²² We use Moody's ratings as opposed to Bloomberg Barclays Index Ratings as index rating methodology has changed over time, formerly using the lower of S&P and Moody's to the current methodology of the median of S&P, Moody's and Fitch.

²³ Desclée, A, J. Hyman, A. Maitra, S. Polbennikov, "Sector and country diversification in credit portfolios: Downgrade versus market risks," Barclays Research, December 2014.

²⁴ Country risk can dominate for EM markets however for developed markets sectors are the key risk dimensions. Risk models also reflect this fact with sector factors for developed markets and country factors for emerging.



Source: LOIM calculations, Bloomberg Barclays Indices.



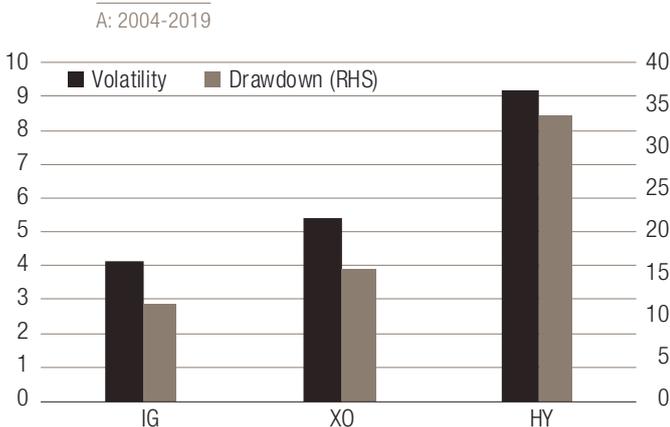
Source: LOIM calculations, Bloomberg Barclays Indices.

Risk comparisons

Crossover bonds tend to outperform IG corporate bonds for the various reasons outlined in the previous section. From a risk perspective, however, crossover tends to have comparable risk to IG and significantly lower than HY.

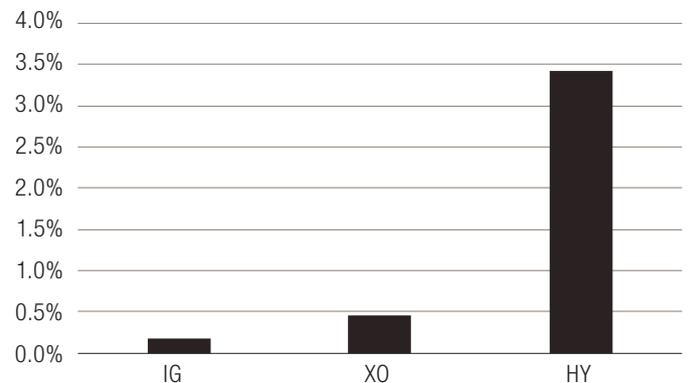
Figure 22 illustrates that crossover market risk is much closer to investment grade than it is to high-yield, with comparable drawdowns and volatility. Post crisis, the volatility and drawdowns are even closer with almost identical drawdowns for the two universes.

FIG. 22 MARKET RISK METRICS: VOLATILITY AND DRAWDOWN



Default risk paints a similar picture in Figure 23, with HY default risk an order of magnitude higher than IG or crossover. This makes crossover especially attractive for a buy-and-hold manager with yield targets that are difficult to achieve via diversified IG rated portfolios.

FIG. 23 MOODY'S DEFAULT RATES OVER THREE YEARS (ANNUALIZED)



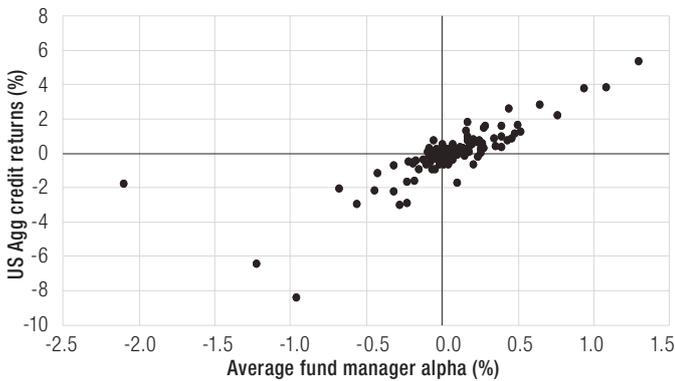
Source: LOIM Calculations, Moody's annual default study 2018.

Active IG managers already have a credit and BB bias

Crossover strategies outperform IG strategies in part from a higher exposure to credit beta. We run a systematic analysis on the alpha of active managers where we show that IG managers also generate significant excess credit exposure that explains the largest proportion of active risk.

In Figure 24 we plot the average tracking error of over 180 of the largest active managers in the US that are benchmarked to the Bloomberg Barclays US Aggregate universe against the credit excess returns of the Bloomberg Barclays US corporate index. We restrict ourselves to funds that have at least 5 years of data, with over USD 100 million in assets and with an ex-post tracking error volatility below 2.5% p.a. The results indicate that the average active manager alpha is strongly linked to credit beta exposures with a credit excess return correlation of nearly 80%.

FIG. 24 CORRELATION OF ALPHA WITH IG CREDIT RETURNS: 2000 – 2018



Source: Morningstar, LOIM Calculations.

Figure 25 shows that the alpha managers are long both IG as well as HY credit, and short rates. These exposures are statistically very significant and explain over 70% of the time variation in alpha. Long credit and short rates exposure is generally expected from a strategy that increases exposure to BB bonds at the expense of A or better bonds, owing to the lower duration of these bonds.²⁵

We find that in recent periods, the exposure to HY credit has increased as the search for yield pushed managers into more BB rated bonds.

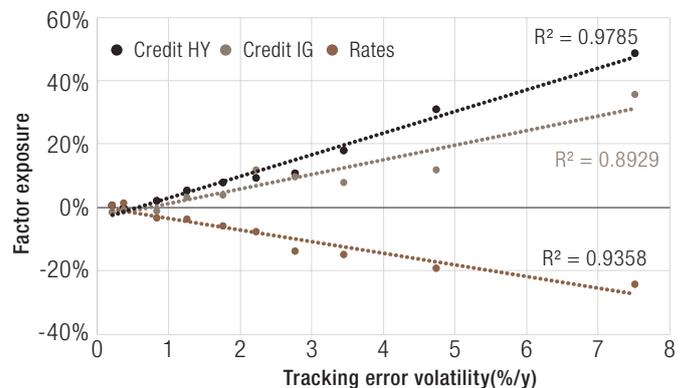
FIG. 25 EXPOSURE TO CREDIT AND RATE RETURNS: 2000 – 2018

	BETA(T-STAT)			R-SQ
	RATE	CREDIT-IG	CREDIT-HY	
JAN 2000 – OCT 2018	-2% _(-2.8)	9% _(6.1)	4% _(5.2)	70%
JAN 2000 – DEC 2009	-3% _(-2.1)	6% _(3.4)	3% _(3.4)	63%
JAN 2010 – OCT 2018	-2% _(-1.8)	8% _(3.3)	8% _(5.6)	80%

Source: Morningstar, LOIM Calculations.

While the average active manager has a significant and persistent excess exposure to credit, we also analyse the cross-section of active managers' alpha. In Figure 26, we show that the higher the tracking error volatility of an active manager, the higher the exposure to credit beta and the lower the exposure to rates. Therefore, active managers take credit exposures both over time and in the cross-section.

FIG. 26 BETA VERSUS TRACKING ERROR VOLATILITY: 2000-2018



Source: Morningstar, LOIM Calculations.

Consequently, we argue a crossover strategy is not dissimilar to an active strategy in IG space. As credit managers become more unconstrained, they tend to move closer to a crossover strategy with significant excess credit exposures over their stated benchmark.

²⁵ HY rated bonds tend to issue largely in the 5 year and below maturity segment while IG shows a significant proliferation of 10 year issuance. One reason is that investors prefer shorter duration credit risky bonds as there is greater cash flow visibility. Another reason is the issuer preference to include callability features that allow issuers to call and reduce interest costs if there is a significant change in credit quality or market conditions.

Conclusion

The crossover segment provides the best risk-return trade-off across the credit spectrum, in our view, creating a credit sweet spot.

Crossover tends to substantially outperform the investment grade universe but with comparable risk, both from a mark-to-market and default risk perspective. Mark-to-market risk is further mitigated from the better credit-rate diversification within this universe resulting in the highest risk-adjusted returns (Sharpe ratio) across rating categories.

Valuation shocks from downgraded bonds (fallen angels), and improving debt fundamentals are the primary drivers of crossover outperformance.

We propose that the improvement in debt fundamentals is from debt holders exercising greater control over the company's financial policy, especially around the IG-HY threshold.

The crossover universe could serve as a replacement for investment grade strategies, owing to similar risk characteristics, sector distributions and ratings.

Active investment grade managers tend to also follow a crossover-type strategy with a systematic over-exposure to credit and underweight to rates indicative of an exposure to BB rated bonds.

This combination of risk and return factors means the crossover space could offer an optimal ratings position for credit investors over the long run.

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