

Fallen angels: spreading their wings

05/23

May 2023

The case for fallen angels

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At a glance

- Although the boundary between investment grade and high-yield corporate debt is somewhat artificial, the two universes tend to appeal to different classes of investors. This results in dislocations, which are a potential source of outperformance.
- Fallen angels are borrowers which have been downgraded from investment grade to high yield. We find fallen angels to be severely undervalued relative to their rating peers and have shown persistently superior risk-adjusted returns versus other corporate credit segments over the last 18 years!¹
- The past outperformance of fallen angels stems from a reversal of the price pressures arising at the time of downgrade and is not simply a consequence of higher yields: price return contributes significantly to long-term performance.
- Fallen angels have similar risks to high-yield corporate debt. At the same time, fallen angels have greater market exposure to a recovery and lower exposure to a sell off. Therefore, fallen angels tend to behave like “convex” high-yield instruments with an asymmetric return profile.
- Fallen angels show a higher exposure to both recovering sectors and issuers, with the “counter-cyclical” supply dynamics of fallen angels contributing to their superior risk-adjusted returns.
- However, fallen angels come with risks. We find fallen angels to be at higher risk of becoming ‘falling knives’ (that quickly drop in price) than rating peers. This necessitates a more rigorous bottom-up analysis than for traditional BB issuers.
- Finally, we address portfolio construction considerations including concentration and liquidity risks, as well as the potential for further performance enhancements via systematic relative value plays within the universe.

¹ Past performance is not a guarantee of future results.

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We find significant outperformance potential for fallen angels versus other fixed income segments.

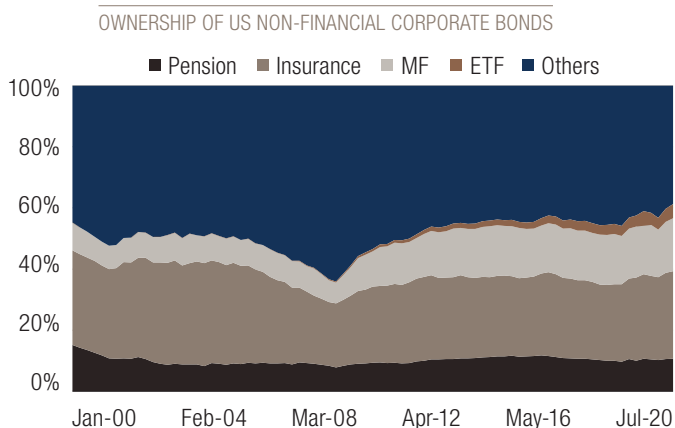
An introduction to fallen angels

Corporate bonds historically have been an investment-grade market dominated by investors seeking a premium to risk-free assets while taking little to no default risk. The rising tide of bond indexation, starting with the Lehman Brothers (and now Bloomberg) USD bond indices, started with an exclusive focus on investment-grade (IG) bonds. Lower rated, high-yield (HY) or “junk” bonds were considered highly speculative off-benchmark bets. It was only in the high-yield boom of the 1980s – largely used to fund risky leveraged buyouts (LBOs) – that the high-yield market took off. The legacy of this distinction between the two universes has resulted in diverging investor bases which appeal to different classes of investors. This somewhat artificial boundary between IG-HY has resulted in dislocations which remain fuelled by the rise of passive indexation benchmarked to these indices. One such dislocation can be observed in the performance of so-called ‘fallen angels’, defined as borrowers which have been downgraded from investment grade to high yield.

Investment-grade index composition changes significantly over time, driven mostly by rating downgrades and new issuers. Through the process of creative destruction, investment-grade issuers eventually downgrade to high-yield and are replaced by new IG issuers. In the process of downgrading, the investor base often changes with more risk-averse and benchmarked investors preferring to sell out of downgraded bonds.

A classic case of forced sales is shown by Ellul et al (2011) wherein insurance companies are more constrained by regulation and therefore much more likely to sell downgraded bonds. The left panel of Figure 1.1 shows that insurance companies are some of the largest owners of corporate bonds at nearly 30% and the right panel indicates that capital charges, especially for life insurers, rise substantially as bonds are downgraded to below investment-grade. Passive investors that follow indexation rules are another well-established source of selling pressure.

FIG. 1.1 CORPORATE BOND OWNERSHIP AND REGULATORY COSTS



Source: St Louis Federal Reserve.

CAPITAL CHARGES FOR US INSURANCE COMPANIES

		REQUIRED CAPITAL CHARGE		
	GRADE	DESIGNATION	LIFE	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%	4.50%
CCC to CCC-	NIG	5	23.00%	10.00%
CC, C, D	NIG	6	30.00%	30.00%

Source: St Louis Federal Reserve.

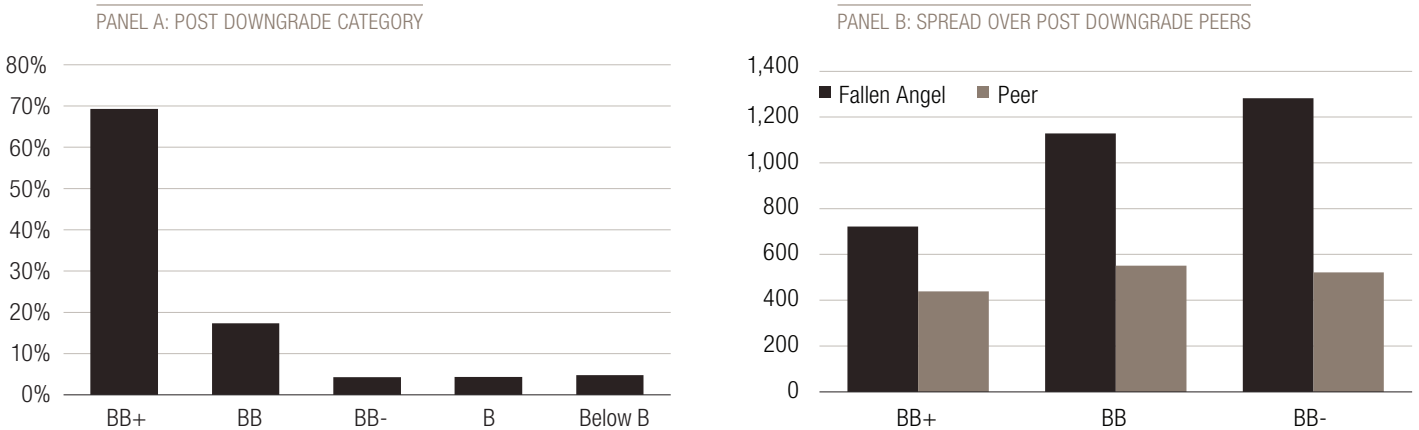
Finally, other institutional constraints are often linked to the provision of liquidity. He & Krishnamurthy (2017) show that in times of distress, when financial intermediaries are the marginal investors and price-setters, there may be large price dislocations. Indeed in a market that is still dominated by the large banks for liquidity provision, this can be a concern as evidenced by the events of the Covid-19 crisis.²

One of the most important empirical results in the study of fallen angels is the documentation of price-pressures following a downgrade. Price-pressures have been documented even when the downgrade has been a single notch (BBB- to BB+). In fact, as seen in the left panel of Figure 1.2, the bulk of fallen angels (almost 70%) were downgraded by one notch and well over 90% remain BB-rated. At the same time these fallen angels are severely undervalued relative to their rated peers, as shown in the right panel where we compare fallen angel spreads with the spread of their peers upon downgrade.

This paper is a comprehensive study of fallen angels both from a valuation perspective as well as from the perspective of demand-supply, fundamentals and other characteristics, and is set out as follows:

Firstly, we describe the size and supply dynamics of the fallen angels universe and how this has developed over the last 20 years. We then dive into the risk/return profile of the universe and look to isolate its key drivers compared with other segments, before further expansion on the universe’s capacity to act as a recovery play. With our case for fallen angels as an asset class established, we then address the key risks within fallen angels from an implementation perspective and present portfolio design considerations associated with these. Finally, we explore the potential for relative value opportunities within the fallen angel universe itself and underline the added value which can be unlocked through a combination of systematic rules and active management.

FIG. 1.2 GLOBAL FALLEN ANGELS: JAN 2000 – MAR 2023



Source: Bloomberg indices, LOIM calculations.

² We show that the breakdown of liquidity provision by intermediaries can lead to a variety of dislocations including the dislocation of exchange-traded-funds (ETFs). For more details see LOIM paper on ETFs, <https://am.lombardodier.com/contents/news/white-papers/2020/december/fixed-income-etfs-a-liquidity-ii.html>

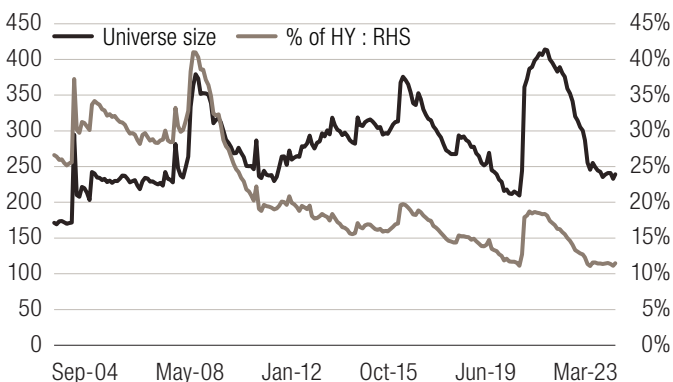
Fallen angels: supply dynamics

The fallen angels universe currently stands at around USD 250bn in size, reverting to sizes more commonly seen historically after the sharp increase in supply on the back of the COVID-19 crisis as seen in Figure 2.1. Indeed, the historical supply of new fallen angels is highly correlated with economic cycles, as stressed economic and market environments lead to heightened downgrade activity by credit rating agencies, generating a wave of fallen angels. Figure 2.1 also shows that the size of the fallen angels universe is now more stable at roughly 10-20% of the high-yield universe, reflecting the lower dominance of large idiosyncratic issuers such as Ford and GM³ in 2005. Figure 2.2 shows spikes in fallen angel supply on a 12-month rolling basis during the dotcom, global financial, Eurozone banking and COVID-19 crises. The latter actually generated the largest 12-month rolling supply of fallen angels ever experienced in the USD market at nearly USD 195 bn

and was just shy of its all-time highs in the EUR market at EUR 55 bn. However, when compared to the overall size of the respective high-yield markets, these bouts of fallen angel supply were actually smaller than historical episodes. This shows that substantially higher levels of fallen angels would be required to materially impact the composition of the high-yield market due to its large increase in size over the past decade.⁴

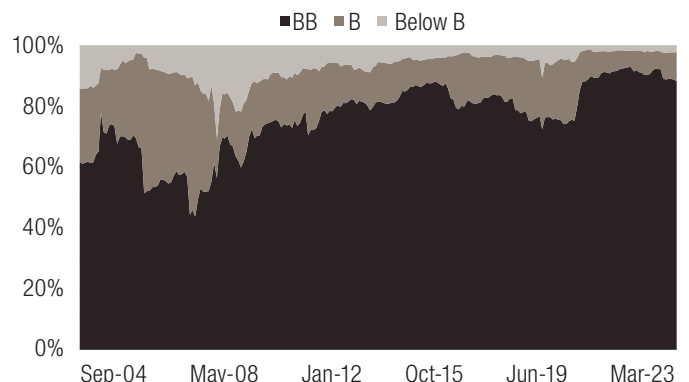
An interesting feature of the fallen angels universe, as seen in Figure 2.3, is that the ratings distribution has been relatively stable and even improved over time with a greater allocation to BBs. In general, we expect the quality of the fallen angels universe to be counter-cyclical i.e. the quality of the universe improves when there is a credit selloff as more BBs enter the investment universe. This is in contrast with the HY (or even IG) universe, where the rating quality deteriorates in a credit downturn.

FIG. 2.1 GLOBAL FALLEN ANGELS: UNIVERSE SIZE



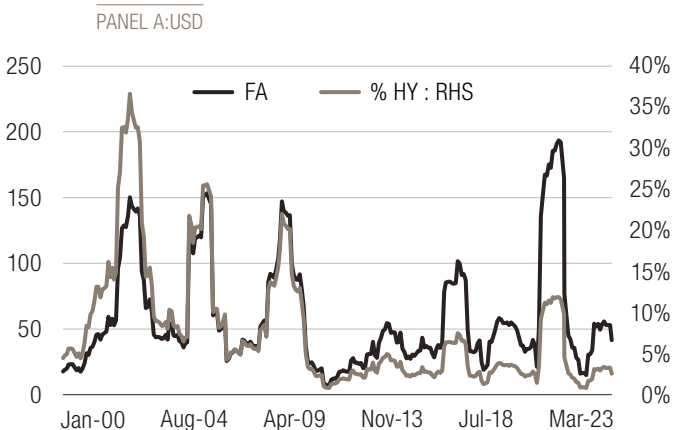
Source: Bloomberg indices, LOIM calculations.

FIG. 2.3 GLOBAL FALLEN ANGELS: RATING DISTRIBUTION

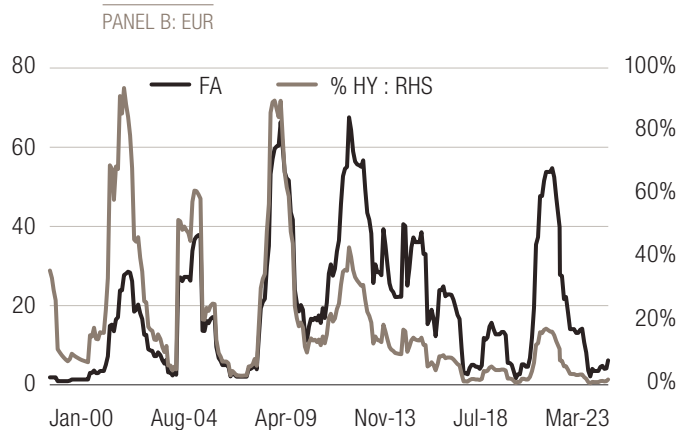


Source: Bloomberg indices, LOIM calculations.

FIG. 2.2 HISTORICAL SUPPLY OF FALLEN ANGELS



Source: Bloomberg indices, LOIM calculations.



³ Any reference to a specific company or security does not constitute a recommendation to buy, sell, hold or directly invest in the company or securities. It should not be assumed that the recommendations made in the future will be profitable or will equal the performance of the securities discussed in this document.

⁴ We dive deeper into the issue of concentration within the fallen angels universe in section 5.1 of this paper.

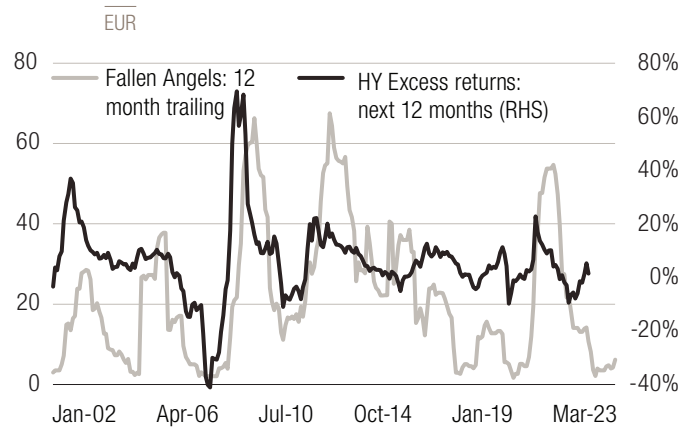
The countercyclical uptick in supply is very beneficial. By definition, supply will peak in line with the downgrade cycle, which tends to lead the bottom of credit sell-offs as seen in Figure 2.4. Ultimately, this increases the weight of 'new' fallen angels within the overall fallen angels universe just before credit rallies.

Later in this paper, we show that this is a very favourable dynamic that can be exploited from the perspective of relative value within fallen angels.

FIG. 2.4 FALLEN ANGELS: SUPPLY DYNAMICS VERSUS MARKET RETURNS



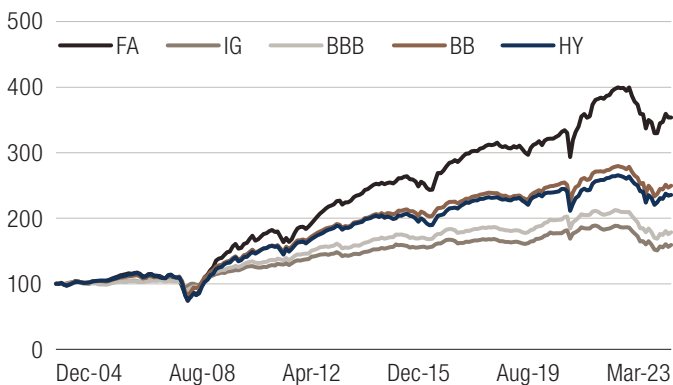
Source: Bloomberg indices, LOIM calculations.



The case for fallen angels

Do the favourable dynamics described in sections 1 and 2 actually translate into an attractive asset class from an investment perspective? An initial look at the historical performance of fallen angels versus other corporate credit segments in Figure 3.1 is extremely promising. Figure 3.1 shows persistently superior risk-adjusted returns⁵ for fallen angels over the last 16 years. To remove dependence of the results from the secular decline in interest rates, we also calculate average credit excess returns. In fact, fallen angels have the highest returns of all ratings

FIG. 3.1 HISTORICAL CORPORATE BOND INDEX TOTAL RETURNS BY RATING BUCKET



categories both from a total return and credit excess return perspective. However this universe also exhibits very elevated market volatility, comparable to the HY universe. Interestingly Figure 3.1 also shows that the average yield of the fallen angels index is similar to the HY index although the return is significantly higher. This indicates that benefits of fallen-angels does not come from superior carry but from price reversion. In subsequent sections we will further analyse the performance patterns of fallen angels including a comparison with the HY segment.

Jan 2010 - Mar 2023	FA	IG	BBB	BB	HY
Total return (%/y)	7.5%	2.7%	3.4%	5.4%	5.2%
Excess return (%/y)	5.9%	0.9%	1.5%	3.8%	3.8%
Yield (%) ¹	6.4%	2.8%	3.4%	5.1%	6.6%
Volatility (total returns)	9.2%	5.3%	6.3%	8.3%	9.7%
Sharpe ratio	0.74	0.37	0.43	0.56	0.46

Dec 2004 - Mar 2023	FA	IG	BBB	BB	HY
Total return (%/y)	7.2%	2.5%	3.1%	5.0%	4.8%
Excess return (%/y)	6.5%	1.5%	2.0%	4.4%	4.3%
Yield (%) ¹	5.1%	2.0%	2.5%	4.1%	5.4%
Volatility (total returns)	7.8%	5.2%	5.8%	6.8%	7.4%
Sharpe ratio excess returns)	0.93	0.50	0.56	0.75	0.66

Source: Bloomberg indices, LOIM calculations. Past performance is not a guarantee of future results. ¹We take the median yield-to-worst hedged in USD .

⁵ Returns are in USD hedged terms, as are all returns reported in this paper from here on.

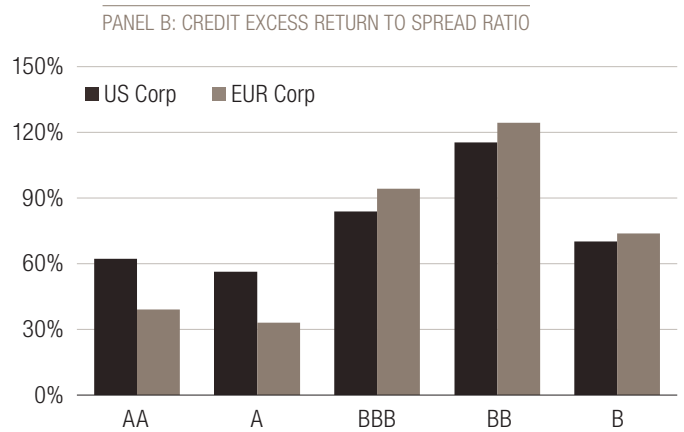
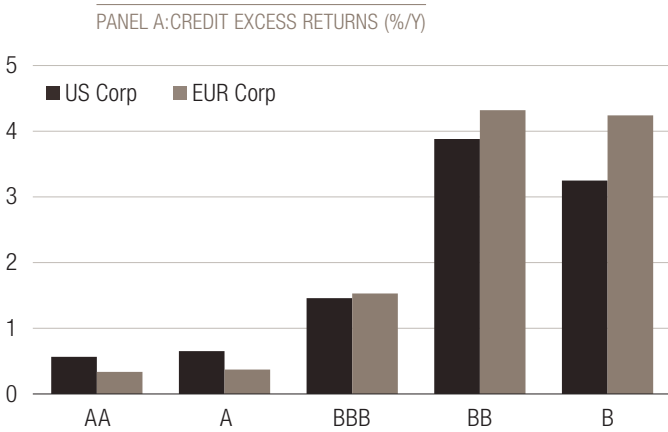
BBs– the rating sweet spot

Before delving deeply into the performance of fallen angels, we need to start with the well-known anomaly of the BB rating category providing the best risk-adjusted returns among broad-ratings categories in the corporate market. As discussed at length in our previous publication⁶ and shown in panel A of Figure 3.2, BB credit outperforms all ratings buckets including the lower rated B buckets from the perspective of credit returns.⁷ This figure also shows that BB-rated issuers have generated credit returns almost three times larger than the nearest investment-grade rating bucket (BBB). Although the magnitude of the outperformance is impressive, the outperformance itself should be

expected due to BBs’ higher spread levels. More surprising is that BBs exhibit higher spread returns than Bs, despite lower spreads. This is thanks to the substantially lower default risk in BBs versus Bs and, hence, reduced default-linked losses.

The ultimate outcome is substantially higher excess returns relative to spread levels, and therefore risk levels,⁸ for the BB bucket exhibited in panel B of Figure 3.2, highlighting the ‘sweet-spot’ characteristic. While 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 fallen angels.

FIG. 3.2 CREDIT SPREAD RETURNS BY RATING CATEGORY



Source: Bloomberg indices, LOIM calculations.

⁶ <https://am.lombardodier.com/contents/news/white-papers/2019-1/august/crossover-the-credit-sweet-spot.html>.

⁷ Credit excess returns is measured as returns over duration-matched Treasuries. This allows for a comparison of the credit component of corporate bond performance.

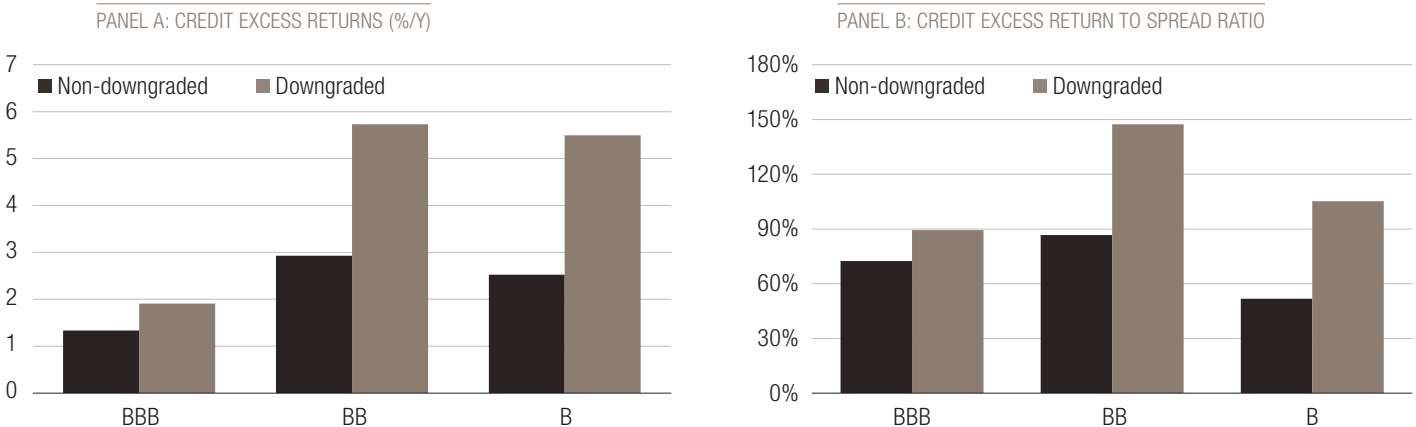
⁸ Ben Dor et al (2007) – spread risk is proportional to spread levels.

Fallen angels (and downgrade) reversion

How much of the favourable risk/return profile of BBs is driven by fallen angels and, in more-general terms, by the mean-reversion of downgraded bonds? Figure 3.3 builds on what Figure 3.2 previously suggests, that fallen angels are indeed substantial outperformers within the BB segment. Panel A indicates that the credit excess returns of BB-rated fallen angels are over 2% higher than bonds originally rated as BB. The performance pattern remains robust even when we control for spread levels. However, we also find that the outperformance of downgraded bonds appears to be a general rule with downgraded BBB and B-rated issuers outperforming strongly as well. This suggests that rating agencies may be late in their assessment with the market having reacted (or over-reacted) before the actual downgrade itself. Recent studies by academics such as Bali & Goyal (2021) also find that downgraded bonds outperform, attributing this outperformance to the greater risk of these bonds.⁹ Our explanation for this phenomenon leans more towards institutional constraints and threshold effects¹⁰ than purely “risk-based” ones. These results provide a powerful argument in favour of downgrade tolerance in corporate bond portfolios as a broad rule. Nevertheless, the clear outperformer, particularly when considered relative to spread levels, is downgraded BB bonds, aka, fallen angels.

A large portion of the outperformance of fallen angels can be attributed to a significant valuation discount relative to their fundamentals, with forced sellers shifting demand-supply dynamics and causing negative price overreactions. Indeed, this is posited in the literature by Ellul & Lundblad (2011) for insurance companies and by Ben Dor & Xu (2011) more generally, as a core rationale for fallen angel outperformance. Price pressures upon downgrade appear to weigh heavily on the valuations of fallen angels as investment-grade investors rush to sell bonds that are no longer index-eligible. Ben Dor & Xu (2011) also present evidence that the price overreaction is amplified when fallen angel supply is significant and HY bond funds are less able to absorb the additional supply in what is likely to be a negative credit environment. Indeed, such issues were seen in practice during the COVID-19 crisis in 2020, prompting the Federal Reserve to include recently downgraded fallen angels in its Secondary Market Corporate Credit Facilities (SMCCF) in April 2020. An increased price overreaction at times of high fallen angel supply again plays into the cross-sectional relative value strategy within fallen angels as alluded to in section 2 and expanded upon in section 6.1.

FIG. 3.3 CREDIT SPREAD RETURNS OF DOWNGRADED VERSUS NON-DOWNGRADED BONDS: 2004 - MAR 2023



Source: Bloomberg indices, LOIM calculations.

⁹ It is however unclear if risk should be a state variable or a path dependent variable. In other words, are downgraded bonds riskier than their peers in the ratings category to which they are downgraded (fallen angels versus BB-rated bonds)? Market pricing appears to indicate this.

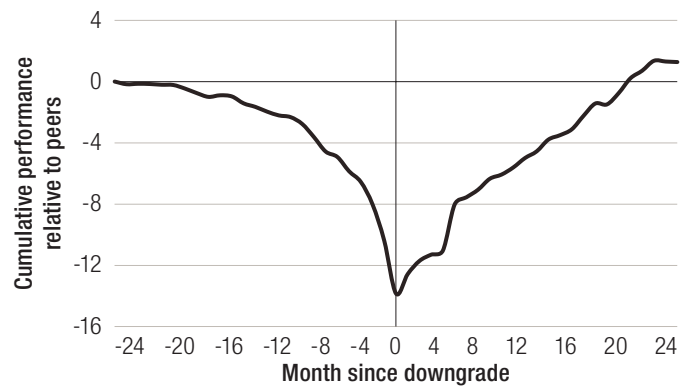
¹⁰ By threshold effects, we mean that bond prices tend to respond (and over-react) to significant changes in information unlike equity price movements that incorporates all information.

Once the downgrade event occurs and forced sellers have exited their positions, demand-supply dynamics should normalise and bring the price back towards the fundamental value. This is similar to findings in the academic literature on long-term reversals in corporate bond markets, as documented by Bali & Turan (2021), showing that losing bonds tend to outperform the most. To test this hypothesis, we run an experiment with the results presented in Figure 3.4. Here, we consider the credit excess performance of fallen angel bonds¹¹ over the past 30 years in the US relative to their peer group¹² by month since the downgrade occurred. The peer group is represented by 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. 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.

Figure 3.4 shows that fallen angels begin underperforming roughly a year before the downgrade month with almost 14% 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. This reflects what we believe to be a general principle in credit – sudden and large over-reactions followed by more gradual reversions.

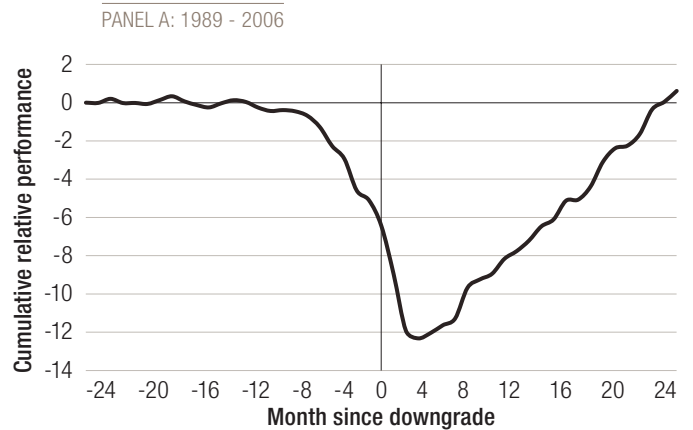
A number of phenomena in credit markets are biased by the financial crisis of 2008. We therefore remove this outlier and focus on the periods 1989 – 2006 and 2010 – March 2023 as shown in Figure 3.5. The pattern observed is remarkably similar in both periods although with an offset. Selling pressure persisted in the earlier period for an additional 3-months, potentially reflecting the rise of indexation and ETFs in the latter period. The cumulative underperformance of 12-15% at the trough and a recovery over the next 24 months indicates a robust effect that has persisted for at least 30 years.

FIG. 3.4 US FALLEN ANGELS – CUMULATIVE PERFORMANCE OVER PEERS: 1989-MAR 2023 (DOWNGRADE IN MONTH 0)

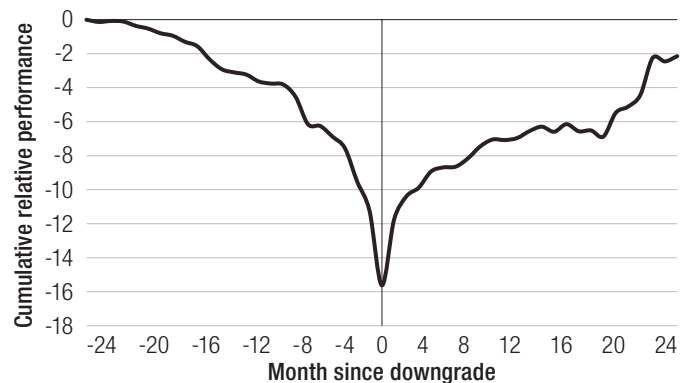


Source: Bloomberg indices, LOIM calculations. For illustrative purposes only.

FIG. 3.5 FALLEN ANGELS CUMULATIVE PERFORMANCE VERSUS PEERS: EX GFC (2007-2009)



PANEL B: 2010 - MAR 2023



Source: Bloomberg indices, LOIM calculations. For illustrative purposes only.

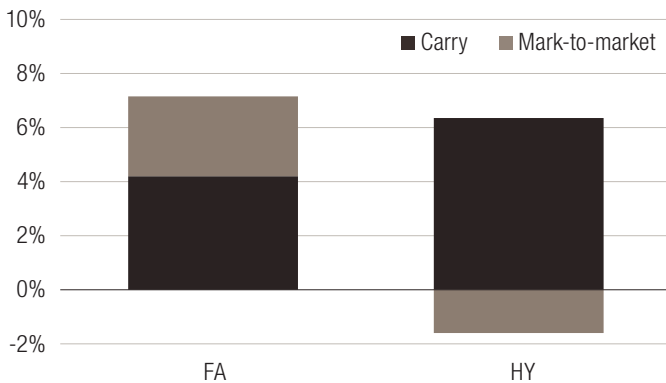
¹¹ We focus on fallen angels that downgrade to BB rating, consistent with the 'BB- Downgraded' segment of figure 3.3.

¹² We use a peer group of sector and post-downgrade rating matched bonds.

Performance implication and comparison with high yield

Figure 3.4 shows that fallen angels outperform HY issuers post downgrade largely due to price-reversal and pull-to-par. A corollary to this is in Figure 3.1 where we report the total returns as well as the hedged yields of the fallen angels index and the high-yield index. The average yield of the fallen angels index is comparable to the high-yield index however the average return is significantly higher. Therefore fallen-angels' outperformance is not a case of higher carry but rather a 'price-effect'. Fallen angels tend to recover rapidly after the selling pressure abates, which explains this outperformance pattern.

FIG. 3.6 ATTRIBUTION OF FALLEN ANGELS AND HIGH-YIELD PERFORMANCE



Source: Bloomberg indices, LOIM calculations.

Figure 3.6 attributes¹³ the performance of fallen angels and high-yield indices to carry and mark-to-market effects. A significant proportion of the total returns of fallen angels (>45%) is from mark-to-market effects while the same attribution for high-yield puts its mark-to-market contribution at close to 0%. This is therefore a key differentiator between the performance of fallen angels and high-yield bonds.

Fallen angels: distress and transitions

Are fallen angels riskier than HY from a long-term default or distress perspective? Indeed, fallen angels have a higher mark-to-market (price) volatility than non-fallen angels as shown in Figure 3.1. However, this is less relevant for a long-horizon investor for whom a permanent capital loss (default) is more relevant. A rationale for this is in the academic literature of Lando &

Skodberg (2002) and Frydman & Schuermann (2008) showing that ratings have momentum and, therefore, a downgraded bond is more likely to downgrade further. Bali & Goyal (2021) also claim that downgraded bonds are riskier than non-downgraded bonds which provides an explanation for the outperformance of downgraded bonds.

To answer this question, we look at the annualised distress probability faced by a buy-and-hold manager investing in fallen angels versus investing in the broad HY index. Distress is defined as an exit price of 50 or below. For example, a fallen angel is held until it exits the investment universe for reasons that may include maturity (less than 1 year of remaining maturity), default, amount outstanding (reduction from tenders and calls or prepayment) or other classification changes. If such a bond exits at a price of 50 or below, this is tagged as a distressed exit. Similar exercises are done at broad high-yield rating levels where a bond enters an investment universe the first time it has a specified broad rating and is tracked until it exits.

As an example, we take the hypothetical case of a bond issued at a BBB rating that is downgraded at the end of the first year to BB and at the end of the second year to B, finally exiting the index in year 5. Such a bond would enter the BBB, BB/FA and B universe at the start of year 0, 1 and 2 respectively. Thereafter the bond is tracked within those universes for five, four and three years, until it exits.

Distress comparisons

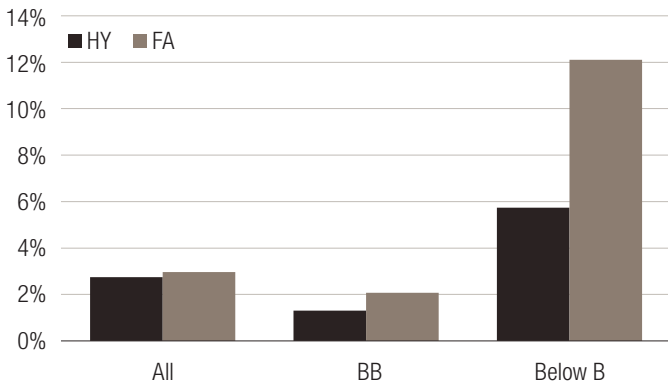
Figure 3.7 plots the annual distress rate in each universe as defined by the rating at which an issue enters the universe. Interestingly, the average distress rate for fallen angels is similar to the HY universe at around 2.8%/y. However, as shown in Figure 2.2, fallen angels are dominated by BB-rated bonds and so the overall distress rate is less informative. When we partition bonds by initial rating, we find that the distress rate of BB-rated issuers is very low at 1.3% while for BB-rated fallen angels it is higher at nearly 2.1%. Similarly for B and below-rated issuers, fallen angels have a distress rate of nearly 11% compared with 6% for the standard HY universe. Note that B-rated fallen angels are not those that eventually downgrade to B or below, but rather incorporate bonds downgraded directly from investment-grade to B or below. Such an event would imply a 4-notch or greater downgrade. While such events are rare (~8% of the total observations), they account for almost a third of all distress events. Such events can therefore signal a falling knife¹⁴ with significant idiosyncratic risk.

¹³ Mark-to-market return is calculated as the price return excluding pull-to-par. Effectively we attribute coupon and pull-to-par returns to carry effects. We use log-returns to allow for an additive decomposition of the two effects. There are small differences with the arithmetic returns used in the rest of the paper.

¹⁴ A falling knife is a fallen angel which continues to deteriorate in quality, and eventually defaults.

This clearly suggests that the long-term risk is higher in fallen angels, although very well compensated by significantly better (cheaper) valuations. **In other words, fallen angels are riskier with a larger proportion of the universe potentially becoming falling knives. Therefore, this necessitates a more rigorous bottom-up analysis than for traditional BB-rated issuers.**

FIG. 3.7 DISTRESS RATES IN US CORPORATE BONDS BY INVESTMENT UNIVERSE: 1994 – MAR 2023

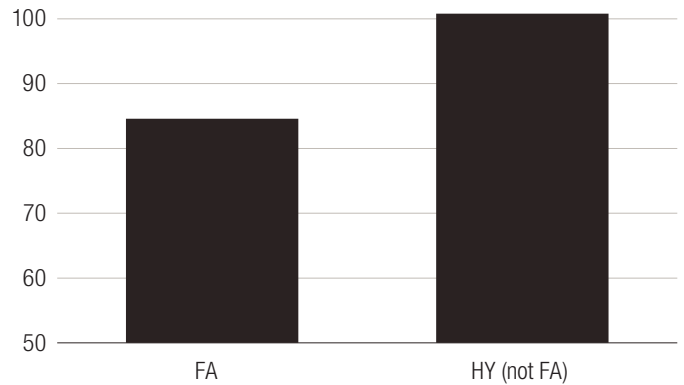


Source: Bloomberg indices, LOIM calculations.

Fallen angels – prices and capital loss

While distress rates seem to be similar for fallen angels when compared to high-yield at around 2.8%, capital losses from distress for fallen angels is much lower than for high-yield. This is because capital loss is a product of the distress rate and the ‘loss-given-distress’. We find that the ‘loss-given-distress’ is lower for fallen angels than for native high-yield bonds. This phenomenon is **not due to lower recoveries** for high-yield bonds but rather from **lower prices at entry** for fallen angels leading to lower ‘loss-given-distress’. Note that fallen angels enter the investable universe upon downgrade while traditional high-yield bonds generally enter at issuance. Figure 3.8 shows that the average price-at-entry for a fallen-angel is slightly above 80 while the average price-at-entry for high-yield is close to 100 reflecting the tendency of issuers to issue at par. This therefore implies that the ‘loss-given-distress’ is likely to be 20-points lower for a fallen angel than for traditional high-yield bonds.

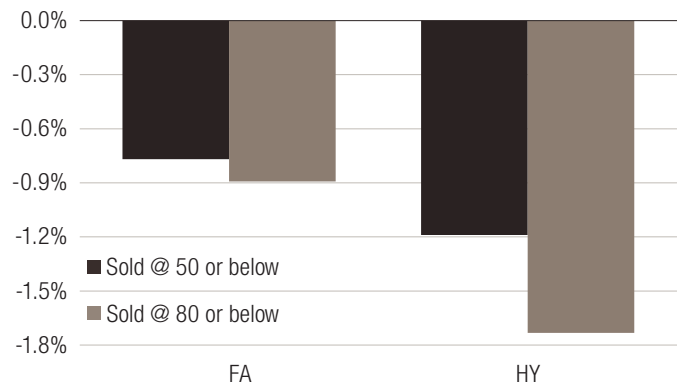
FIG. 3.8 PRICE AT ENTRY FOR FALLEN ANGELS AND HIGH-YIELD



Source: Bloomberg indices, LOIM calculations. For illustrative purposes only.

What do lower prices translate to in terms of permanent capital losses? We assumed that a long-horizon investor invests into a fallen-angel and high-yield bond as it enters the universe and sells it when it exits the universe. We then calculated capital losses as being the difference between the entry and exit price – similar to the concept of “book-losses.” Figure 3.9 indicates that the capital loss for cases when the bond exits at a distressed price of 50 or below is ~0.8%/y for fallen angels. This is almost 40% lower than for traditional high-yield bonds at 1.2%/y in spite of similar distress rates. The difference is even more stark when we consider capital losses for cases when the bond exits at a price of 80 or below. For these cases, the average capital loss for fallen angels is 0.9%/y, almost half of high-yield bonds at 1.75%/y.

FIG. 3.9 CAPITAL LOSSES FOR FALLEN ANGELS AND HIGH-YIELD BONDS

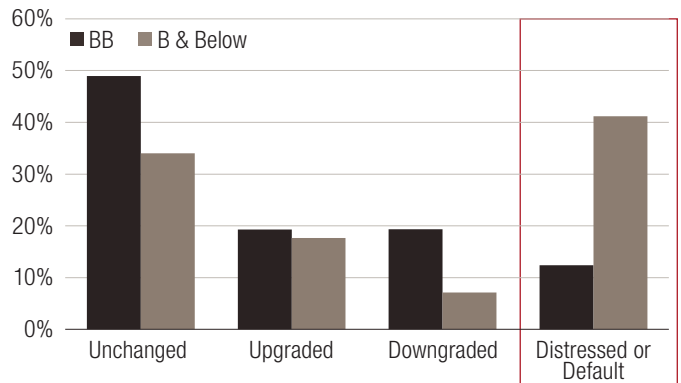


Source: Bloomberg indices, LOIM calculations.

Where do fallen angels end up?

We can further show the increased falling knife risk by looking specifically at the dynamics of the BB and B fallen angels. A fallen angel is tracked until it exits the index, at which point it is determined to be either “unchanged”, “upgraded” (next higher letter rating), “downgraded” (to next lower letter rating), “distressed or defaulted”.¹⁵ In the right panel of Figure 3.7 we see clearly that B and lower rated fallen angels have a very high tendency towards default or distress, leading to permanent capital losses. BB-rated fallen angels are generally unchanged from a credit-quality perspective with an equal tendency towards upgrades or downgrades. Defaults and distress risk remain for this rating category (10% of cases but are generally more manageable).

FIG. 3.10 FALLEN ANGELS’ FINAL STATE (TO MATURITY/EXIT): 1994 – MAR 2023



Source: Bloomberg indices, LOIM calculations.

Fallen angels examples

While the outperformance of fallen angels is a broad phenomenon driven by market wide forces, focusing on a few anecdotal cases can provide more tangible evidence of the type of price action that can be expected. As such, we present two case study examples:

Bilfinger¹⁶

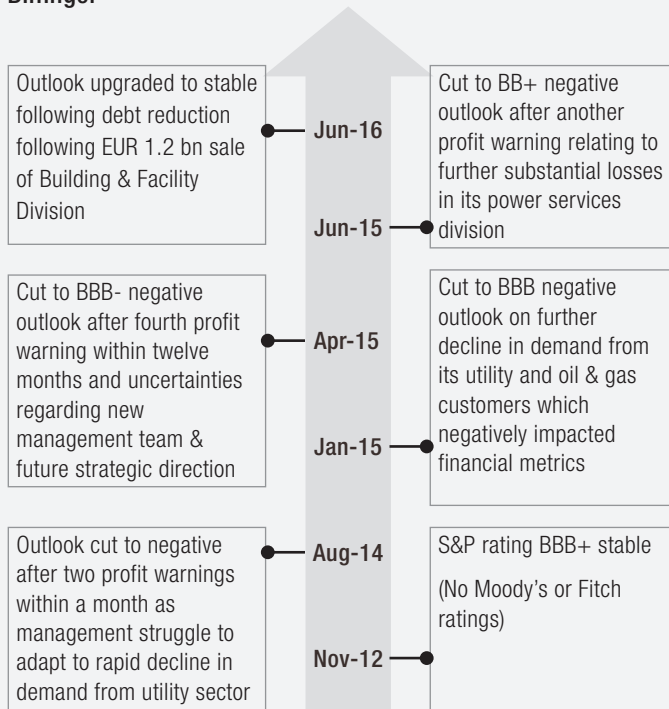


FIG. 3.11 BILFINGER – GBFGR 2.375% 12 JULY 19



Source: Bloomberg. For illustrative purposes only. Past performance is not a guarantee of future results.

¹⁵ Note that we combined distressed and defaulted. Distress follows the simple specification as above i.e. bonds exiting the broad high-yield index at a price of below 50. Default includes names that may exit at a higher price but are officially classified as a default.

¹⁶ Any reference to a specific company or security does not constitute a recommendation to buy, sell, hold or directly invest in the company or securities. It should not be assumed that the recommendations made in the future will be profitable or will equal the performance of the securities discussed in this document.

Ford

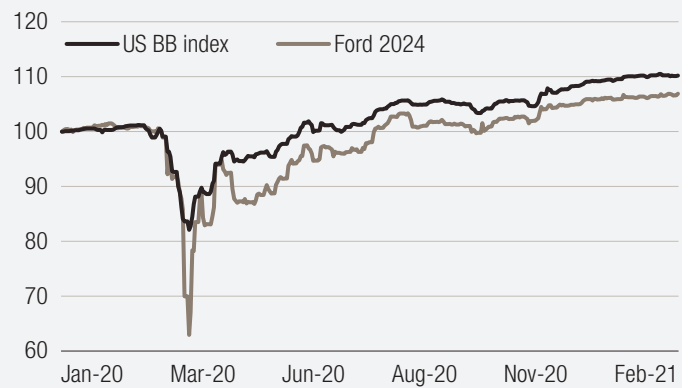
Ford,¹⁷ which is one of the oldest and most well-known auto companies in the world, was downgraded to high-yield at the peak of the COVID-19 crisis in March 2020. Note: this was Ford's second foray into fallen angel territory, having been downgraded from investment grade in 2005 as well.

The downgrade of Ford along with Occidental Petroleum accounted for nearly USD 62bn of the total USD 90bn of downgrades in the month of March. This was the largest supply of fallen angels in any historical month. Ford had one BB rating (Moody's) and two BBB- ratings (S&P and Fitch) until March. S&P downgraded Ford by a single notch (although with a negative outlook) to BB+ on 25 March. This downgrade coincided with the March bottom and extreme fund outflows. Bond spreads overshot the average BB universe by over 500bps (over 20 points below the implied move by the BB index).

The performance of Ford in 2020, however, was very distinct from previous episodes as there was a strong reversion soon after the downgrade and selloff. The initial recovery was liquidity related, with the actions of the US Federal Reserve driving price action. The recovery happened through two channels: firstly, dealer funding conditions were enhanced through the primary dealer credit facility (PDCF) and, secondly, the credit markets

were backstopped by the secondary (primary) market corporate credit facility S(P)MCCF. This highlights the role of intermediaries in enhancing market dislocations through their provision of liquidity and cements the Federal Reserve as a market-maker of last resort as proposed by O'Hara and Zhou (2020). Thereafter, we see a more regular recovery in Ford reflecting the long-term tendency of credit over-reactions to reverse.

FIG. 3.12 FORD – F 3.664 09/08/2024



Source: Bloomberg. For illustrative purposes only. Past performance is not a guarantee of future results.

¹⁷ Any reference to a specific company or security does not constitute a recommendation to buy, sell, hold or directly invest in the company or securities. It should not be assumed that the recommendations made in the future will be profitable or will equal the performance of the securities discussed in this document.

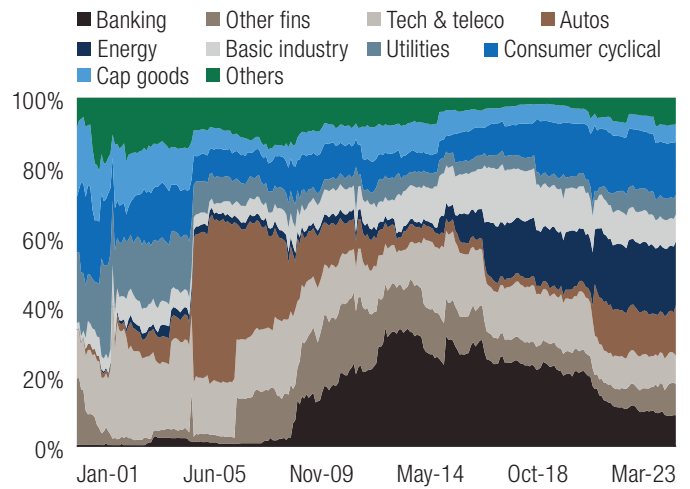
A cyclical recovery play?

Playing the recovering sectors

Fallen angels tend to be a sector-recovery play as much as an over-reaction within sectors. Sectors that are under the greatest pressure tend to over-react, with an even greater over-reaction from the fallen angels within that sector. In Figure 4.1, we see that the largest sector has shifted over time reflecting leverage cycles in various sectors. In the early 2000s, we see a resurgence in technology and telecom fallen angels. In 2005, the large downgrades of Ford and GM dominate the index, while in 2008-09 it is dominated by the banking sector. In 2016, we see the energy and basic-industry sector weights increase substantially on the back of the commodity crisis, while during the COVID-19 crisis in 2020, we observe downgrades of the auto and energy sectors. Note that the banking sector has now changed from the largest fallen angels sector, a position held for over 10 years, to fourth behind autos, energy and consumer cyclical.

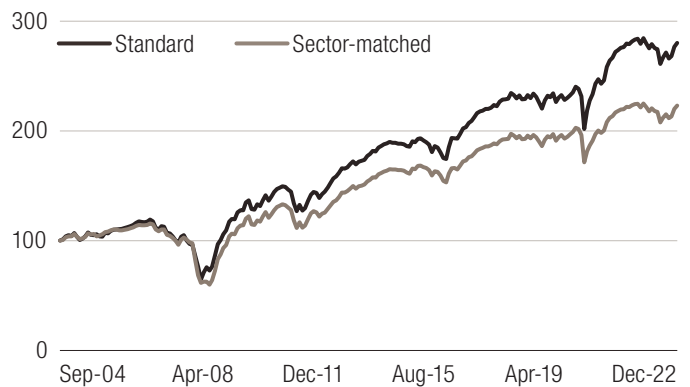
The recovery of cyclically affected sectors contributes significantly to fallen angels. We test this by calculating the performance of the index of fallen angels by re-weighting the sectors to be in line with the broad corporate index¹⁸ as seen in Figure 4.2. Here we report the credit excess returns of the sector matched and the standard index of fallen angels. Note that in all subsequent analysis we focus on credit excess returns and excess return volatility to remove interest rate effects from all results. The sector-matched version underperforms the standard index of fallen angels, indicating that sector-recovery contributes significantly to the strong performance of fallen angels.

FIG. 4.1 SECTOR ALLOCATION (%) OF THE GLOBAL FALLEN ANGELS UNIVERSE



Source: Bloomberg indices, LOIM calculations.

FIG. 4.2 FALLEN ANGELS (STANDARD AND SECTOR-MATCHED): EXCESS RETURNS



	STANDARD	SECTOR-MATCHED
Excess return (%/y)	6.3%	5.0%
Volatility : excess returns (%/y)	11.2%	11.2%
Sharpe ratio (excess returns)	0.56	0.47

Source: Bloomberg indices, LOIM calculations. From Sep 2004 - Dec 2022. Past performance is not a guarantee of future results.

¹⁸ We use the sector weights of the combined IG+HY index. Similar results if we use the IG index.

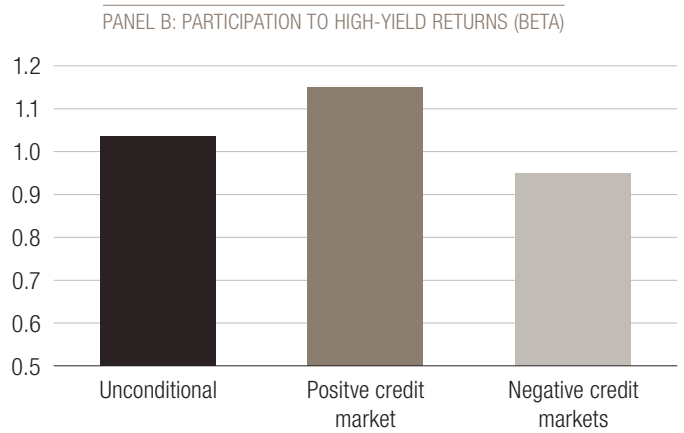
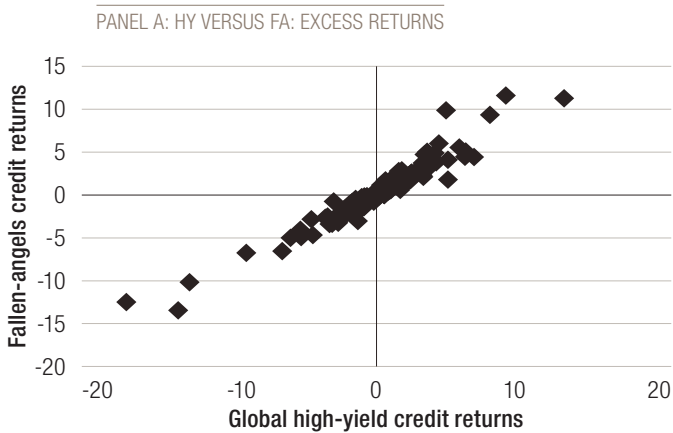
Fallen angels – playing market recoveries (asymmetric betas)

The supply dynamics of fallen angels are very well positioned for a recovery in the overall credit cycle. This is a combination of two effects:

1. The supply of fallen angels peaks at the end of the cycle and
2. The recovery of credit markets (overall and the recovery of distressed sectors) begins once the downgrade wave is completed reflecting the over-reaction of credit and peaks in market pessimism that coincide with a wave of rating-agency downgrades.

One way to test exposure to recoveries is to calculate conditional betas of the universe of fallen angels. In panel B of Figure 4.3, we calculate betas of the fallen angel universe to the high-yield universe, both unconditionally and conditional on up and down moves. The unconditional beta is close to 1 indicating similar market exposures as the high-yield index over the full cycle. The conditional beta however is 10% lower on the downside (negative market returns) and over 10% higher on the upside. **Therefore, fallen angels provide a convex high-yield exposure.** The net positive convexity comes both from a reversal of price over-reaction as well from an increased exposure to recovering sectors and markets from the supply dynamics of fallen angels.

FIG. 4.3 FALLEN ANGELS VERSUS GLOBAL HIGH-YIELD CREDIT EXCESS RETURNS



Source: Bloomberg indices, LOIM calculations.

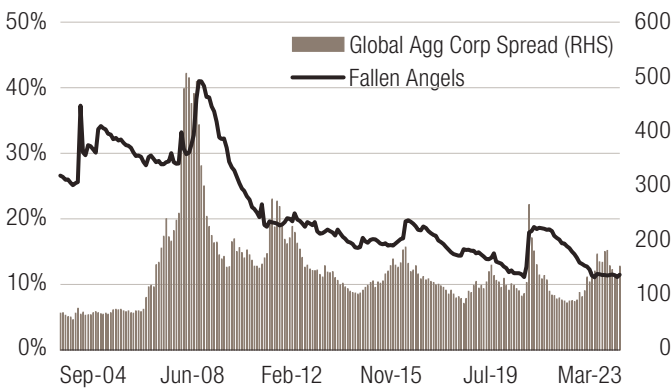
Risk and index design considerations

Concentration issues

Driven by factors such as the size of investor bases and the maturity of markets, the historical development of the corporate bond market's structure has resulted in an IG market which is much larger than its HY counterpart. As at March-end 2023, the total market capitalisation of global IG and HY corporate indices was USD 11.2 trillion and USD 2.4 trillion, respectively. As such, it follows that when a fallen angel transitions from IG to HY, its relative size can have a disproportionate impact on the latter universe composition.

In Figure 5.1 we graph the size of the fallen angels segment in the HY universe, as well as the spread (OAS) of the global corporate index as a proxy for market stress. As expected, during downturns the share of fallen angels in the HY index increases. However, even though the COVID-19 crisis increased the proportion by 67%, the overall concentration of fallen angels within HY declined from the highs of the Lehman crisis.

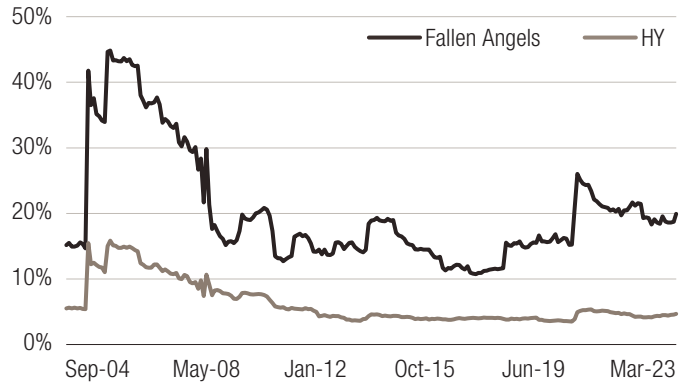
FIG. 5.1 US FALLEN ANGELS WEIGHT IN BROADER HY UNIVERSE VERSUS US CORPORATE SPREAD (OAS)



Source: Bloomberg indices, LOIM calculations.

More pertinent than the aggregate size of fallen angels is their composition: in the same way that fallen angels have an outsized role in HY, do individual issuers also have an outsized role in the fallen angels index? To illustrate this, in Figure 5.2 we aggregated the market value weights of the top-3 names of the fallen angels index and also compared this measure to that of the broader HY index. Indeed, we can see that the fallen angels index exhibits signs of dominance by a small number of names, which increases in downturns and approached 25% in the aftermath of the COVID-19 shock. The peaks of 2005, driven by the downgrades of Ford and GM, however, remained untouched.

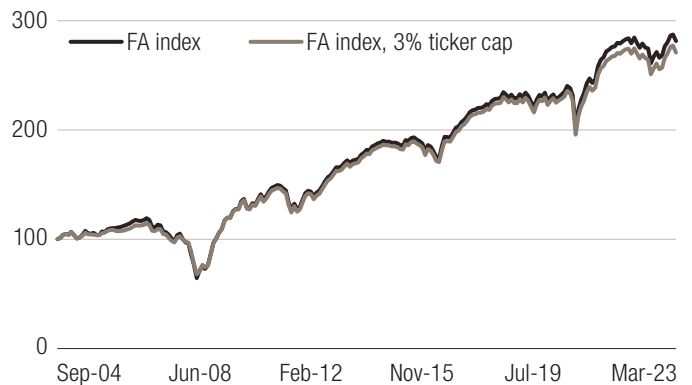
FIG. 5.2 SUM OF TOP-3 ISSUERS BY WEIGHT



Source: Bloomberg indices, LOIM calculations.

For investors in fallen angels, this creates concentration and posits the question whether fallen angels' outperformance is driven by idiosyncratic risk. To test this possibility, we re-weight the universe of fallen angels so that no ticker (issuer) exceeds 3% and compare its excess return to that of the standard index of fallen angels. We observe in Figure 5.3 that the returns and volatilities are comparable although marginally lower and Sharpe ratios are almost identical. This implies that one can "dilute" the biggest fallen angels to avoid concentration risk without compromising on the risk/return profile.

FIG. 5.3 FALLEN ANGELS WITH A TICKER CAP



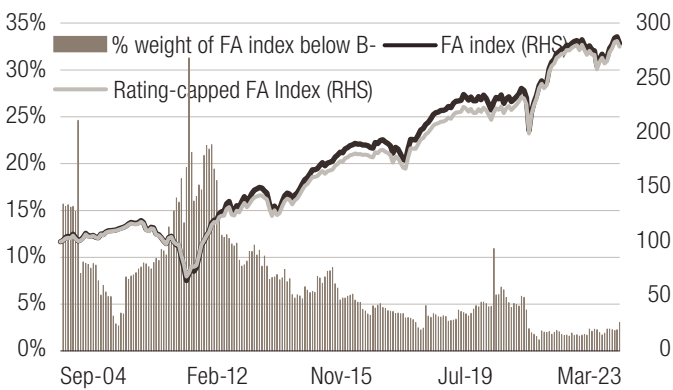
	FA INDEX	FA INDEX, 3% TICKER CAP
Excess return (%/y)	6.8%	6.5%
Volatility excess returns (%/y)	11.5%	10.9%
Sharpe ratio (excess returns)	0.59	0.60

Source: Bloomberg indices, LOIM calculations. Sep 2004 - Mar 2023. Past performance is not a guarantee of future results.

Idiosyncratic risks

As seen in Figure 3.6, the distress risk of a fallen angel increases sharply the closer it approaches to the CCC+ credit rating territory. While this segment of fallen angels has been relatively small for the past decade, it shot up to almost 30% of the overall universe by the end of 2008, implying a significant exposure to idiosyncratic risk. One solution is to exclude any issues rated below B-. To test this, we compare the fallen angels universe to a fallen angels universe that just includes names rated B- or better. Figure 5.4 shows that both risk-adjusted returns and drawdowns improve on applying this simple ratings threshold.

FIG. 5.4 RATING-CAPPED FA INDEX RETURNS



	FA INDEX	RATING-CAPPED FA INDEX
Excess return (%/y)	6.8%	6.6%
Volatility excess ret (%/y)	11.5%	10.5%
Sharpe ratio (excess returns)	0.59	0.63
Max Drawdown	-46%	-42%

Source: Bloomberg indices, LOIM calculations. Sep 2004 - Mar 2023. Past performance is not a guarantee of future results.

Liquidity issues

Fallen angels originate from IG issuers and IG issuers tend to issue at longer maturities than HY. Therefore fallen angels are, on average, older than their HY peers. Furthermore, since the fallen angels universe is only replenished when there are downgrades, there is no steady supply of new issuance as there would be in IG or HY. The lack of supply in benign times increases the average age of the index. Older bonds trade less often (since a lot of them will be owned by buy-and-hold institutional investors to match long-term liabilities), which means that fallen angels are less liquid than their HY peers on average.

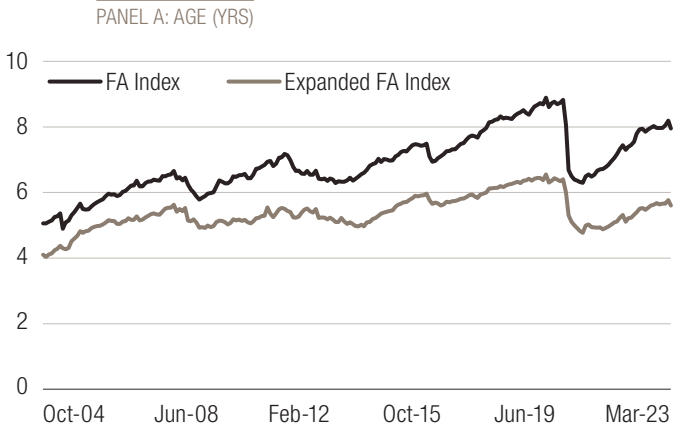
Such liquidity constraints can have a materially negative effect on the realised performance of a portfolio if not accounted for, and hence must be addressed in the implementation of any fallen angels strategy. One way to mitigate this issue is by expanding the fallen angels index to include not only the active bonds of a ticker at the time of a downgrade, but also any subsequent HY issues under said ticker (referred to as the 'expanded' fallen angels index). Note: we ensure the ticker-weights in the expanded fallen angels index are the same as in the traditional index, thereby creating a more liquid version of the index with no change in systematic or idiosyncratic risk. In Figure 5.6, we construct the expanded fallen angels index and compare the differences in age and liquidity cost score ("LCS", a commonly used measure for liquidity; higher score equals higher cost). By including the subsequent issues of a previously downgraded issuer, we immediately reduced the index age by about 1 year on average, while also lowering the LCS. Interestingly the left panel of Figure 5.6 shows that while the age of the fallen angels index has increased following the large supply in March and April of 2020, the expanded index has not, reflecting significantly increased issuance from fallen angel tickers in the recovery from the COVID-19 crisis.

FIG. 5.5 GLOBAL LIQUIDITY STATISTICS AS AT 31 MARCH 2023

	GLOBAL IG	GLOBAL HY	GLOBAL FA
Size: Amt Out (USD bn)	12,300	2,061	230
Age (yrs)	4.3	3.3	7.7
Bid-ask (Barclays LCS)	0.72	1.34	1.39
Num Bonds	15554	3130	390
Num Issuers	2111	1404	156

Source: Bloomberg indices, LOIM calculations.

FIG. 5.6 FA INDEX VS. EXPANDED FA INDEX



Source: Bloomberg indices, LOIM calculations Sep 2004 - Mar 2023.

In Figure 5.3 we showed how capping the ticker weights of the fallen angels universe can reduce concentration risk without notably changing the risk/return profile. We can combine this finding with the expanded fallen angels universe definition, by capping ticker weights but also expanding the bonds under each ticker to include post-downgrade HY issues. Figure 5.7 shows little effect on the historical risk/return profile, suggesting that it is possible to both reduce idiosyncratic risk as well as improve the liquidity of the universe, which in turn should make implementation easier.

PANEL B: LCS (%)

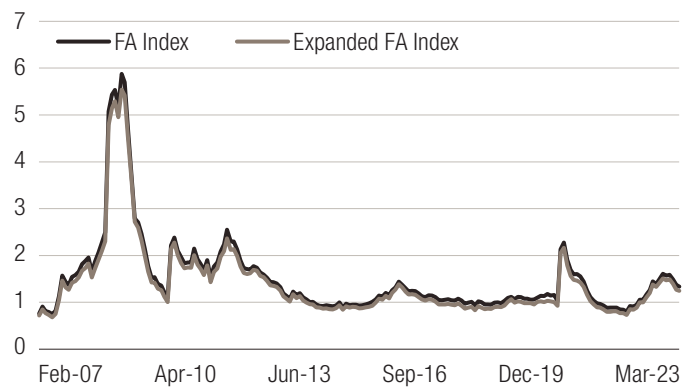
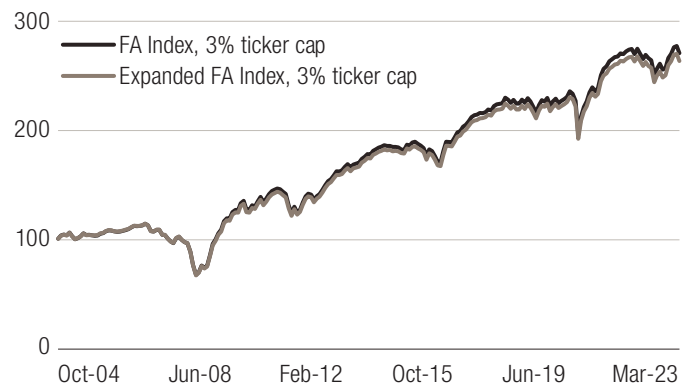


FIG. 5.7 EXPANDED FALLEN ANGELS UNIVERSE WITH A CAP ON TICKER WEIGHTS



	FA INDEX, 3% TICKER CAP	EXPANDED FA INDEX, 3% TICKER CAP
Excess return (%/y)	6.0%	5.8%
Volatility excess ret (%/y)	10.6%	10.6%
Sharpe ratio (excess ret)	0.56	0.55
Max Drawdown	-40.9%	-41.2%

Source: Bloomberg indices, LOIM calculations. Sep 2004 - Mar 2023. Past performance is not a guarantee of future results.

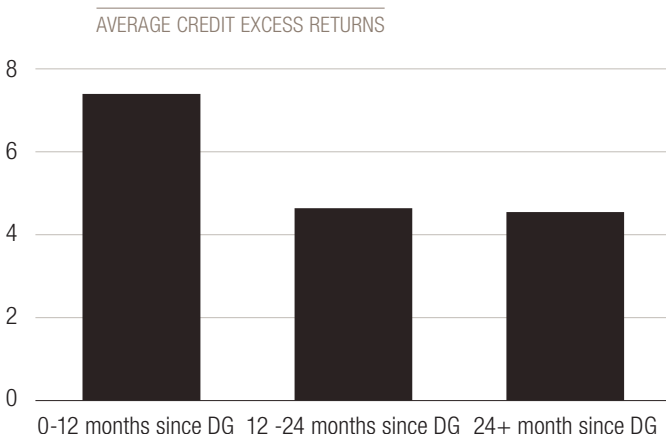
Relative value within fallen angels

Age of fallen angels

Figure 3.4 indicates that a large part of the reversion in fallen angels is realised in the first year post the downgrade. This raises the possibility of over-weighting newer fallen angels while being under-weight aged ones. We test this hypothesis by calculating the average credit excess returns for fallen angels split by the number of months from the downgrade. Figure 6.1 shows that the most recent fallen angels outperform but are also much more volatile. The 6-12 month cohort also performs strongly but with lower volatility and marginally higher Sharpe ratios. Finally, the cohort that are aged over 1-year significantly underperforms the broad index.

Looking at the betas conditional on HY returns in the table of Figure 6.1, we can see that this relative value has appealing asymmetric market directionality characteristics. Newer fallen angels have significantly higher participation in market rallies than older fallen angels with a beta of 1.37 to market rallies, while their participation in sell offs is lower than the broader market (downside conditional beta of 0.86). As alluded to previously in this paper, the positive effect from this is enhanced by supply dynamics, as the weight of new fallen angels within the overall fallen angel universe peaks just prior to market recoveries. Note that once we move beyond a year, fallen angels behave broadly in line with HY peers, with conditional and unconditional betas closer to 1.

FIG. 6.1 RETURN STATISTICS OF FALLEN ANGELS SORTED BY MONTHS FROM DOWNGRADE



SUMMARY STATISTICS BY TIME SINCE DOWNGRADE

	FA (ALL)	1-6 MONTH SINCE DG	6-12 MONTHS SINCE DG	12+ MONTH SINCE DG
Average excess return : %	6.17	7.39	4.64	4.54
Volatility (excess return) : %	11.21	13.79	10.89	11.03
Sharpe ratio	0.55	0.54	0.43	0.41
Unconditional beta	1.03	1.07	0.98	0.97
Upside Conditional Beta	1.19	1.37	0.89	1.04
Downside Conditional Beta	0.92	0.86	1.05	0.93

Source: LOIM Calculations. Return and volatility figures are annualised. Conditional Betas calculated against excess returns of Global HY index. Sep 2004 - Mar 2023. Past performance is not a guarantee of future results.

Maturity of fallen angels

The sections discussed above contend that the “fallen angels effect” appears to be a transient price-pressure or over-reaction. Over the longer term, fallen angels tend to be riskier than regular bonds. Therefore, bonds that have a longer maturity remain in the fallen angels index well after the price-pressure has dissipated. We therefore consider the performance of fallen angels with the exclusion of longer-dated bonds. We also exclude longer-dated bonds that have an age in excess of one year. In this case, we include longer-maturity, but recently downgraded bonds.

FIG. 6.2 CREDIT EXCESS RETURNS BY AGE AND MATURITY: 2004 - 2023

	FA (ALL)	FA (<10Y MATURITY)	FA (<10Y MATURITY OR AGE < 1Y)
Average excess return: %/y	6.20	6.00	6.60
Volatility (excess-return): %/y	11.20	10.30	10.70
Sharpe ratio	0.55	0.59	0.62

Source: LOIM Calculations. Past performance is not a guarantee of future results.

In Figure 6.2, we find that excluding longer-dated fallen angels reduces risk while maintaining returns. Excluding longer-dated fallen angels, except the newly downgraded ones, enhances return as well resulting in a 15% increase in Sharpe ratios.

Fallen angels over-reaction

Fallen angels tend to exhibit a price over-reaction, with the greatest over-reactions likely to provide the highest recovery potential. However, fallen angels also tend to be riskier than traditional peers. For example, fallen angels that enter the universe on the back of a 4-notch downgrade (directly to B+ and below) tend to run into distress at a rate that is 5-times that of the BB fallen angels distress rate (11% versus 2%). Therefore, an approach focusing on fallen angels' over-reaction should try and prevent investment in falling knives.

We used a set of three metrics to build a modified fallen angels strategy:

1. Current over-reaction;
2. Current rating; and
3. Age of the fallen angel (time since downgrade).

FIG. 6.3 FALLEN ANGEL OVER-REACTION STRATEGY: 2004 – 2023

PANEL A: PERFORMANCE STATISTICS

	FA (STANDARD)	FA (OVER-REACTION STRATEGY)	OUT-PERFORMANCE
Average excess return %/y	6.2	7.0	0.8
Volatility (excess-return): %/y	11.2	11.8	1.3
Sharpe ratio	0.55	0.59	0.65

The modified strategy doubles the weight of the issues that satisfy:

1. The spread of fallen angels at least 50bps above a comparator spread;¹⁹
2. The time since downgrade to high-yield of less than 1-year;
3. A rating of BB- or better.

The above strategy is not a strictly relative value strategy since we use an absolute cut-off for over-reaction. However, such a strategy would make minimal interventions in benign times as there is no spread over-reaction. In volatile times, however, the strategy would scale up significantly with much larger deviations from a standard strategy. A simple heuristic, as outlined previously, enhances the fallen angels strategy by almost 1% in credit returns without a significant increase in volatility. As a result the Sharpe ratio is enhanced by almost 10%. The outperformance pattern, as seen in Panel B of Figure 6.3, shows that in periods following a crisis (the GFC, commodities crisis, COVID-19), the strategy significantly outperforms while being in line with the market-cap strategy in benign times.

PANEL B: OUTPERFORMANCE OF OVER-REACTION STRATEGY



Source: Bloomberg indices, LOIM calculations. Sep 2004 - Mar 2023. Past performance is not a guarantee of future results.

¹⁹ We use spread of duration and fine-rating matched bond portfolio with duration within 2-years of the fallen angels. We do not match for sector since we want to load on the sector-recovery story

Conclusions

A corporate bond universe bluntly split into distinct investment-grade and high-yield markets at the BBB/BB boundary has resulted in the unique performance characteristics of the fallen angels universe. In this paper we have taken a deep dive into the source of the segments' risk/return profiles, and find significant outperformance potential versus other fixed income segments, and present a number of structural channels through which this outperformance can continue to persist. We also show that the outperformance is through a "valuation reversal" and not "fundamentals-improvement" channel. The valuation-reversals of fallen angels occurs both at an issuer-specific, as well as a sector, level. Therefore, a recovery of beaten-down sectors and companies combined with supply dynamics that overweight these sectors and issuers results in a significant performance enhancement for fallen angels. We find that these reversal dynamics result in fallen angels having higher beta to high-yield during a recovery and lower beta during a sell-off, thus providing convex high-yield exposure. We show that fallen angels can have more idiosyncratic risk than their ratings-based peers, therefore necessitating greater analyst research to prevent owning falling knives.

While providing impressive risk-return trade-offs, the asset class has its limitations with respect to implementation with liquidity and concentration risk being key hurdles. We highlight the key hurdles facing investors in accessing fallen angel premia, namely concentration and liquidity and present solutions to address these concerns without sacrificing performance.

As a further step, we present further opportunities for relative value within fallen angels themselves, which active management can exploit. We find that recently downgraded fallen angels outperform those downgraded over 12 months ago. Also shorter duration bonds outperform longer bonds from a risk-adjusted return perspective. Finally, we show that a rules-based criteria to select extreme over reactions can boost performance further by capturing greater price recovery opportunities, whilst simultaneously navigating falling knives.

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