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Maturity Dependence of Corporate Bond Returns

- Despite their higher average spreads, long-dated corporate bonds have delivered both lower information ratios and lower excess returns than short maturity ones in the US IG market over the past 25 years.
- We attribute realized excess returns to various factors, including carry, roll-down on the term structure of spreads, sample-specific trend in spread and downgrade-related costs and find strong maturity dependence for all these factors.
- While part of the difference in excess returns between long and short-dated bonds can be associated with sample-specific changes in spread, roll-down of the spread curve and costs associated with rating migration are also persistent and significant factors. These effects vary depending on rating quality and maturity.
- From February 1994 to January 2019, the average excess return of 1-3y maturity bonds was 93bp/y, only 10bp lower than the average OAS of 103bp. For the 20-35y bucket, average excess return was 43bp/y, 120bp lower than the average OAS of 163bp. A sample specific steepening of the spread curve is the largest contributor to this shortfall, followed by maturity differences in the costs of rating downgrades and in roll-down returns.
- The relationship between return and maturity is not monotonic. The 10yr sector performed worst as its higher liquidity comes with lower spreads relative to shorter maturities and lower roll-down returns.

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Introduction

Maturity dependence of credit is an important consideration for many investors, beyond mutual funds and absolute return investors. In particular, liability managers are structural buyers of long-maturity debt in the presence of long-dated liabilities. The decision to invest along the maturity spectrum must therefore be based on a precise understanding of what makes performance vary depending on maturity.

Market practitioners have known for many years that risk-adjusted excess returns of corporate bonds tend to decrease as maturity is extended: the information ratio of credit excess returns is generally lower for long-dated bonds than for short-dated ones. This phenomenon has been extensively discussed and has sometimes been associated with a possible "low volatility anomaly" in the credit market[1]. Such an anomaly would allow investors who systematically overweight short-dated and underweight long-dated credit bonds to benefit from positive returns without being exposed to commensurate risk.

The relative importance of different investor bases in short and long maturity sectors could lead to market segmentation. In particular, the underperformance of long-dated bonds on a risk-adjusted basis may result from the existence of investors who measure risk relative to long-dated liabilities. These economic considerations are not the subject of this study as we instead try to explain the mechanism by which short and long corporate bonds have persistently delivered different performances[2].

We provide an update of this empirical evidence using US investment-grade corporate bond data for a 25-year period. We find that not only have information ratios decreased when maturity is extended, but that *average excess returns* have also decreased with maturity even though the term structure of spread has had a positive slope.

What are the factors causing such a phenomenon? We perform a return attribution analysis and highlight the contribution of four effects: spread accretion, spread curve roll-down, a sample-specific steepening in the spread curve and a persistent drift of investment-grade bonds towards lower rating qualities. All four factors exhibit strong maturity dependency, sometimes of opposite sign. We also find that these factors can differ substantially in magnitude when comparing A-rated and Baa-rated universes.

We also evaluate the performance of a strategy that systematically overweights short over long maturity credit in a DTS neutral way and document performance for various strategy specifications. We confirm that such "credit steepeners" are directional on credit market performance and on traditional measures of risk aversion.

Performance by maturity bucket

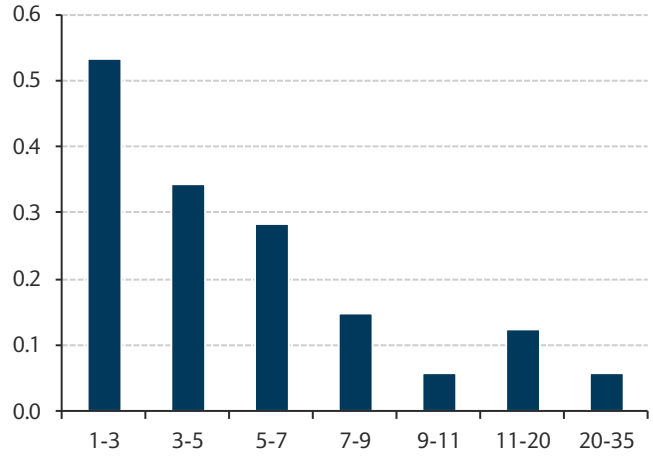
We study bonds[3] included in the Bloomberg Barclays US Corporate Bond Index which we partition in seven maturity sectors: 1-3, 3-5, 5-7, 7-9, 9-11, 11-20 and 20-35 year based on average life. The first three buckets rely on breakpoints widely used by index publishers. The 7-9 and 9-11 year buckets keep using a two-year interval up to and including the 10-year sector, in which much new issuance is observed. The two longest maturity buckets cover larger maturity ranges given the need for diversification within each bucket. Our study

[1] Low volatility anomaly is a phenomenon related to persistently higher risk-adjusted returns of less risky securities. Useful references include Naik, V. M. Devarajan, and E. Wong, "The Anatomy of Credit Curve Trades Over the Economic Cycle", Quantitative Credit Research Quarterly, 2007-Q2", Lehman Brothers Fixed Income Research; Ambastha, M., A. Ben Dor, L. Dynkin, J. Hyman, "Do Short-Dated Corporates Outperform Long-Dated Corporates? – A DTS-Based Study"; and Ng K-Y., and B. Phelps, "*Structure of US Corporate Excess Returns, The Hunt for a "Low-Risk" Anomaly*", Barclays Research 2014

[2] This continues the work of our Credit Strategy colleagues in *U.S. Credit Focus: Excess Returns Mature Poorly*, Barclays Research, 2016

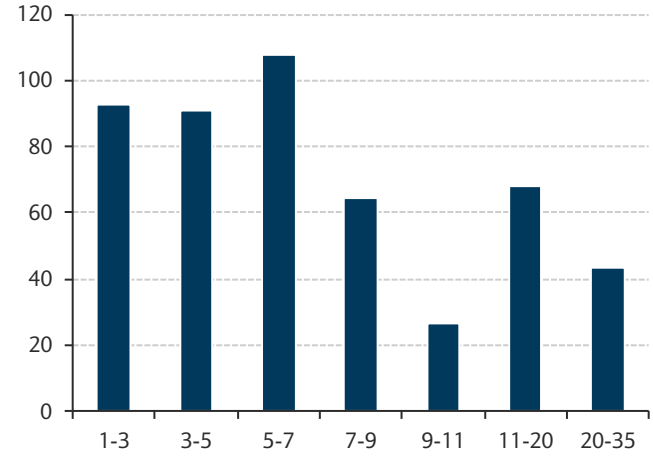
[3] We exclude bonds with significant optionality, bonds with average life lower than 1 or higher than 35 at the beginning of any calendar month, bonds with extremely high OAS.

FIGURE 1
Information ratio of maturity buckets (1994 to 2019)



Source: Bloomberg Barclays Bond Indices; Barclays Research

FIGURE 2
Average excess return of maturity buckets (1994 to 2019) (bp/y)



Source: Bloomberg Barclays Bond Indices; Barclays Research

period covers 25 years, from the end of January 1994 to January 2019. All returns included in our analysis are excess returns, as reported by the index provider, calculated as the difference between corporate bond total return and the total return of a duration-matched hypothetical Treasury portfolio. Excess returns allow us to isolate the return component associated with credit spreads from the effects of changes in Treasury yields.

The maturity sectors included in our study can include different sets of issuers or sectors because we would like to represent the market structure as available to investors across all maturities. Indeed, some sectors, such as utilities, account for a large share of long maturity buckets while others, such as Bank and Brokerage, have large weights in short maturity sectors. However, our attribution analysis is performed using individual issuer curves, as we explain later.

Figure 1 shows a clear pattern of decreasing information ratios as maturity is extended: average excess return per unit of risk, measured as standard deviation of monthly returns, decreases almost monotonically. This phenomenon has been documented in the past and has sometimes been associated with a "low volatility anomaly" in credit markets. Figure 2 is more striking as it shows that average returns – even before adjusting for risk – have been lower for long maturity sectors than for shorter ones, in an uneven pattern.

Repeating our calculation of average returns and information ratios for five non-overlapping 5-year windows (shown in Figure 3), we find that this pattern of decreasing performance with maturity has been persistent, although not monotonic. Extending spread duration was associated with higher returns only in the strong spread rally that followed the 2008 crisis (period 4 in Figure 3). But even then, information ratios declined with maturity.

FIGURE 3

Performance of US IG maturity buckets in five-year sub-periods

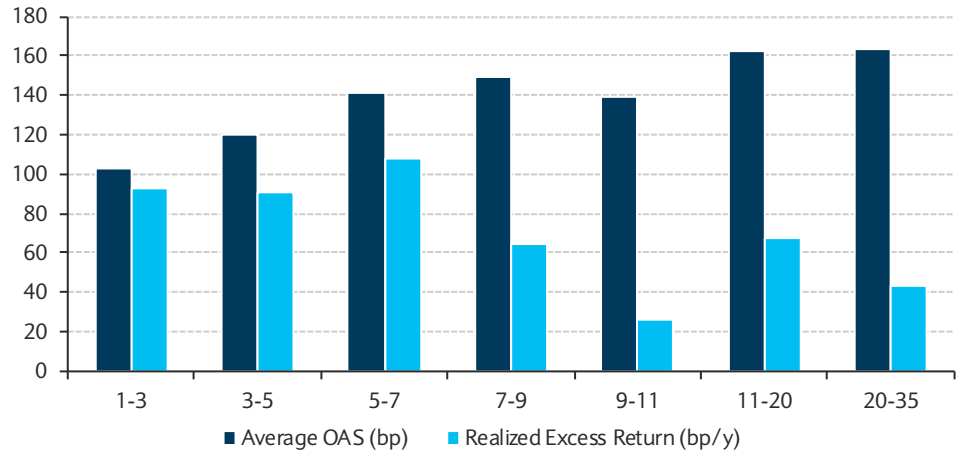
	1-3	3-5	5-7	7-9	9-11	11-20	20-35
Realized Excess Return (bp/y)							
1. from 1994 to 1999	45	35	11	-4	-30	-4	-28
2. from 1999 to 2004	102	82	94	34	18	45	55
3. from 2004 to 2009	-65	-204	-299	-407	-356	-486	-496
4. from 2009 to 2014	307	439	591	571	406	664	643
5. from 2014 to 2019	73	103	143	130	95	120	41
Information Ratio							
1. from 1994 to 1999	0.92	0.35	0.08	-0.02	-0.15	-0.01	-0.08
2. from 1999 to 2004	0.86	0.45	0.33	0.09	0.05	0.09	0.09
3. from 2004 to 2009	-0.22	-0.49	-0.53	-0.67	-0.60	-0.75	-0.56
4. from 2009 to 2014	1.59	1.34	1.22	1.04	0.65	0.92	0.64
5. from 2014 to 2019	1.20	0.80	0.70	0.49	0.33	0.25	0.07

Source: Bloomberg Barclays Bond Indices; Barclays Research

The low returns of long maturity buckets are surprising given that average spreads have been higher for longer maturities, as shown in Figure 4. The ability of OAS to anticipate excess returns varies significantly across maturities: short maturity bonds exhibit average returns close to their average OAS while returns of long maturity bonds are much lower than their average OAS.

FIGURE 4

Average OAS and average excess returns of subsets of the US IG Corp Index (1994-2019)



Source: Bloomberg Barclays Bond Indices; Barclays Research

Attributing performance

To understand why average excess returns of corporate bonds tend to decline with maturity, we perform a return attribution exercise. We use four factors to explain performance – spread carry, roll-down return, spread trend and downgrade costs – and detail them below:

- Spread carry represents the spread accretion from holding a bond that trades at a positive spread over the Treasury curve. We observe it at the beginning of each month following periodic index rebalancing.
- Roll-down return is the price return from valuing a bond at a spread corresponding to a one-month shorter maturity, while keeping the spread curve unchanged. If the curve has a positive slope, price returns are positive. Roll-down return is estimated from spread curves of individual issuers calibrated at the beginning of each month[4].
- Spread trend reflects the sample-specific cumulative change in spread that arises because market conditions at the beginning and at the end of our 25-year time sample period could differ substantially. One could be tempted to assume that 25 years is a long enough period for spread variations to cancel out, so as to play only a negligible role on average returns, but, as we will see later, this is not the case.
- Downgrade cost is the last term in our attribution. It represents the price return from relatively rare defaults and more frequent rating downgrades. Although downgrade cost is estimated as the residual term from the three preceding factors, we detail below how it can be further attributed to costs crystalized when bonds leave an index upon monthly rebalancing following a rating downgrade, and those that are associated with the spread drift of continuing bonds.

Figure 5 provides characteristics of the seven maturity buckets together with an estimated return attribution to these four factors for the 25-year period considered. It includes two parts: the top panel relates to the entire investment-grade market while the bottom panel covers only non-financial issuers. Results are similar for both panels although the returns of short and intermediate maturity buckets are lower for non-Financials than for the whole market. After adjusting for the effect of the sample-specific trend in spreads, the highest historical return is observed for the 11-20year bucket[5].

[4] We consider issuers with bonds outstanding in at least three out of seven maturity buckets. For these issuers, we estimate spread curves, which are used to derive bond roll-down returns. The spread curves of eligible issuers are aggregated and used to calculate roll-down return of other similar issuers that have fewer outstanding bonds.
[5] This is consistent with the recent analysis of our Credit Strategy team in *Twenty-year Bonds Show Good Potential*

FIGURE 5

Characteristics and performance attribution of US IG and IG ex Financials Corp maturity buckets (Feb 1994 to Jan 2019)

	1-3	3-5	5-7	7-9	9-11	11-20	20-35
All Investment-Grade							
Characteristics							
Average OAS (bp)	103	120	141	149	139	162	163
Average OASD	2.0	3.6	5.1	6.4	7.4	9.6	12.1
Average Spread Slope (bp/y)	8.9	7.4	7.1	0.1	-3.7	2.2	0.1
Trend Change in OAS (bp/y)	1.7	2.5	3.5	3.7	4.0	5.6	4.9
Average Returns							
Spread Carry (bp)	103	120	141	149	139	162	163
Roll-down (bp/y)	16	25	36	0	-27	20	-2
Spread Trend (bp/y)	-3	-9	-18	-24	-30	-53	-60
Residual, including Estimated Downgrade Cost (bp/y)	-23	-45	-52	-61	-56	-60	-58
Realized Excess Return (bp/y)	**93**	**91**	**108**	**65**	**27**	**68**	**43**
Excess Return excluding spread trend (bp/y)	96	100	126	88	56	121	103
Volatility and I.R.							
StDev ER (bp/y)	174	265	380	433	449	551	728
Realized Information Ratio	**0.53**	**0.34**	**0.28**	**0.15**	**0.06**	**0.12**	**0.06**
All Investment-Grade excluding Financials							
Characteristics							
Average OAS (bp)	102	119	140	145	136	163	162
Average OASD	2.0	3.6	5.1	6.4	7.4	9.6	12.1
Average Spread Slope (bp/y)	7.8	6.5	6.0	-0.5	-3.2	1.9	0.1
Trend Change in OAS (bp/y)	1.4	2.3	3.3	3.6	4.0	5.4	5.0
Average Returns							
Spread Carry (bp)	102	119	140	145	136	163	162
Roll-down (bp/y)	14	22	31	-3	-23	18	-1
Spread Trend (bp/y)	-3	-8	-17	-23	-30	-52	-61
Residual, including Estimated Downgrade Cost (bp/y)	-29	-51	-57	-61	-58	-61	-66
Realized Excess Return (bp/y)	**84**	**82**	**97**	**58**	**25**	**69**	**35**
Excess Return excluding spread trend (bp/y)	87	91	114	81	55	120	96
Volatility and I.R.							
StDev ER (bp/y)	178	262	373	419	438	557	726
Realized Information Ratio	**0.47**	**0.32**	**0.26**	**0.14**	**0.06**	**0.12**	**0.05**

Source: Bloomberg Barclays Bond Indices; Barclays Research

Although the spread curve has been positively sloped, on average, over the past 25 years, the slope has been more pronounced in short and intermediate maturities, meaning that roll-down returns have been small in long maturities and especially in the ten-year sector, where they are negative.

The slope and roll-down data in Figure 5 are consistent with a dip in average return for the 9-11 year sector, as seen in Figure 4. A possible explanation for this effect can be that bonds in this bucket are generally more liquid than those in neighbouring buckets and that such liquidity advantage translates into lower spreads. Indeed, the 9-11 year bucket includes the portion of the curve with the largest volume of new issuance. As shown in the rightmost

column of Figure 6, 40% of bonds included in the US IG Corp index at the end of January 2019 were issued with a maturity between 9 and 11 years. That maturity bucket also includes by far the largest proportion of recently issued bonds: 86% issued in the past two years, as opposed to 44% for the 7-9 year and 35% for the 3-5 year buckets. This large allocation to recent issues can have the effect of making that bucket relatively more liquid, with a low average bond age compared with other buckets.

FIGURE 6

Characteristics of maturity subsets of the US IG Corp Index on 31 Jan 2019

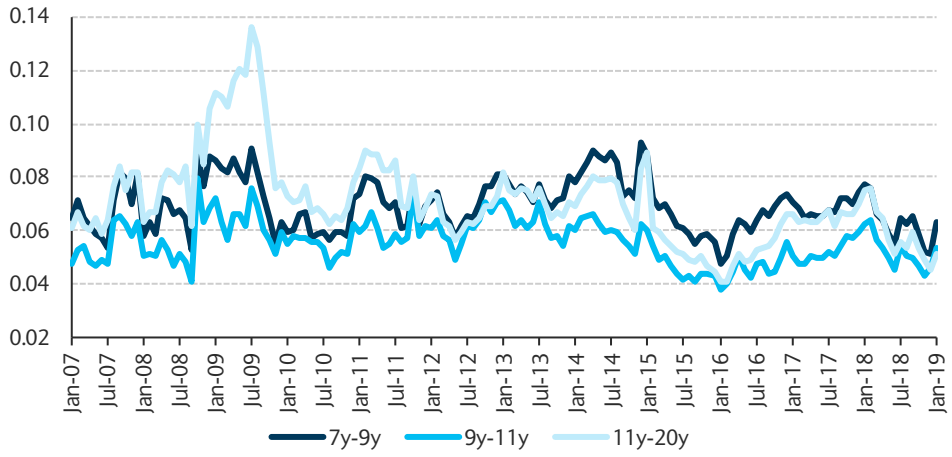
Maturity Bucket	Percentage of bonds with age less than 2yr	Average age (year) of bonds in maturity bucket	Percentage of new issuance by maturity bucket
1-3	24%	4.5	1%
3-5	35%	4.0	5%
5-7	21%	3.7	13%
7-9	44%	2.8	6%
9-11	86%	2.5	40%
11-20	12%	10.6	2%
20-35	28%	4.3	31%

Source: Bloomberg Barclays Bond Indices; Barclays Research

A more direct way of observing a possible liquidity advantage is shown in Figure 7, where we plot the average Liquidity Cost Score (LCS) per unit of DTS spread exposure of the 7-9, 9-11 and 11-20 year buckets. This is reported for the more recent part of our data sample as LCS are available only from January 2007[6]. A low value indicates low transaction cost per unit of risk and hence higher secondary market liquidity. Figure 7 shows clearly that bonds included in the 9-11 year bucket have enjoyed persistently higher liquidity than those in adjacent buckets. This liquidity advantage can explain the lower spread of that sector.

FIGURE 7

Liquidity Cost Score per unit of DTS for maturity subsets of the US IG market



Source: Bloomberg Barclays Bond Indices; Barclays Research

Long maturities are characterized by higher average spreads but flatter spread curves. The spread curve has even been persistently inverted in the 9-11 year bucket. In that sector, a vast majority of bonds are recent issues with high liquidity but also lower spreads than older

[6] For an introduction to Barclays Liquidity Cost Scores, see Konstantinovsky V., K. Y. Ng, and B. Phelps "Measuring Bond Level Liquidity", Journal of Portfolio Management, Summer 2016. For an introduction to Duration Times Spread, see A. Ben Dor., L. Dynkin, J. Hyman, P. Houweling, E. van Leeuwen, and O. Penninga "DTS^{SM}, Duration Times Spread", Journal of Portfolio Management, Winter 2007

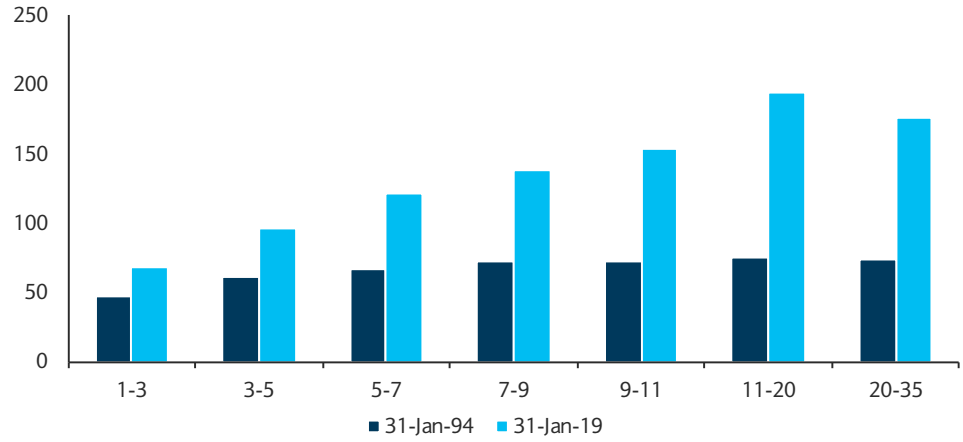
bonds. As these bonds age, their liquidity advantage tends to disappear and their spread normalizes relative to peers[7]. This normalization process leads to an inverted or flat spread curve for maturities just below ten years, which results in lower roll-down returns. On the other hand, shorter maturity buckets, up to seven years, are characterized by steeper spread curves and exhibit higher roll-down returns than longer maturity buckets.

Our study is based on index data, with new bonds joining the index at calendar month-end following issuance. Therefore, our analysis does not capture the new issue concession available to investors who participate in the primary market. Capturing issuance concessions could contribute significantly to portfolio performance relative to the index.[8]

The level and shape of the spread curve has changed substantially in the past 25 years, as shown in Figure 8. These changes account for the third factor in our analysis: spread trend. The average increase in spread is less than 2bp/y for the 1-3 year sector but over 5bp/y for long maturities (see the fourth row of Figure 5). This secular bear steepening leads to negative returns (labelled Spread Trend in the middle of Figure 5) that are much larger for longer maturities than for shorter ones. For example, the return of the longest maturity sector (20-35 years) would have been 103bp/y in the absence of any trend in spread, 60bp/y more than actually realized. In contrast, the effect of the spread trend is only 3bp/y for the 1-3 year bucket.

FIGURE 8

Average OAS of IG maturity buckets at beginning and end of 25-year time window



Source: Bloomberg Barclays Bond Indices; Barclays Research

Excess returns become more similar across maturities if we add back the effect of sample-specific trend in spreads to realized returns, as shown in the bottom row of the middle section of Figure 5. But even in that case, there is no return advantage of extending maturity beyond seven years.

The fourth factor explaining index returns is measured as the residual term after accounting for the previous three factors: carry, roll-down return and spread trend. We assume that much of it is associated with realized and unrealized (downward spread drift) changes in credit quality and therefore call it "cost of rating downgrades", although it could also capture the effect of some unrelated spread changes.

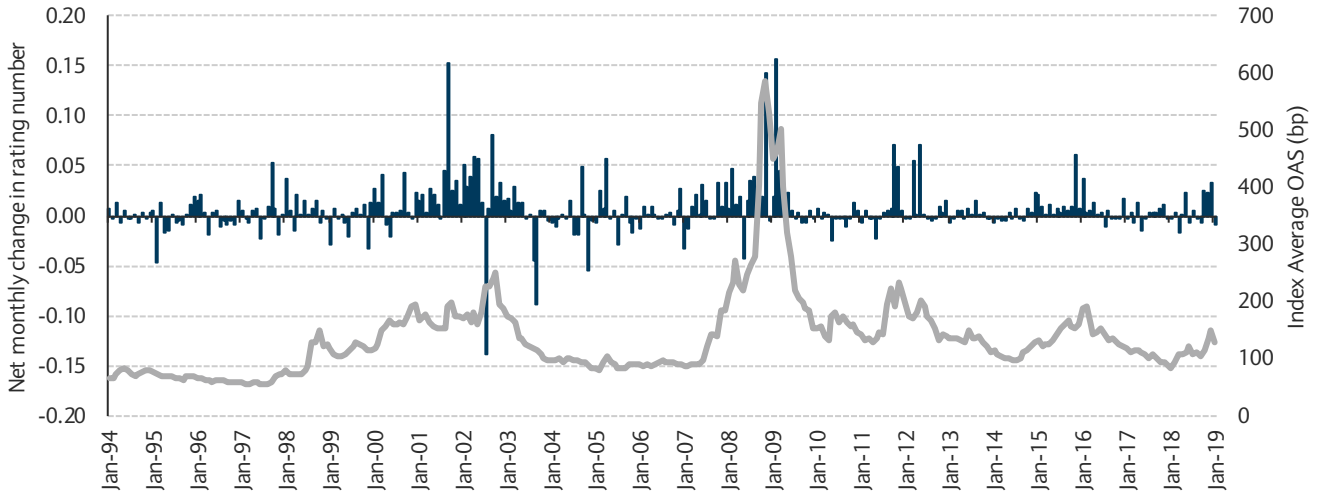
[7] For more details, see *Dynamics of Spread Between New and Old Bonds of the Same Issuer*, Barclays Research, January 2017

[8] We quantify concessions in corporate bond issuance in *Concessions in Corporate Bond Issuance: Magnitude, Determinants, and Post-Issuance Dynamics*, 23 January 2015.

Figure 9 illustrates a systematic drift towards lower rating quality in our IG universe. For each month, we contrast the month-end average rating quality, expressed in numerical value on a linear scale, with its beginning-of-month value. A bar with a positive value indicates a net change towards a lower average rating quality as more and or stronger downgrades than upgrades were observed in that month. The chart also reports the average OAS of our universe: rating quality tends to deteriorate more when spreads are high. It is also when average index OAS is high that the difference in spreads between rating buckets becomes the widest and therefore that the return penalty associated with a downgrade is largest[9].

FIGURE 9

Net monthly change in rating quality (in unit of fine rating notches) averaged across all maturities for the IG universe



Source: Bloomberg Barclays Indices; Barclays Research

Bonds join the investment-grade index as they meet specific quality and other criteria but leave following a default or a downgrade below investment-grade. Previous research[10] has shown that most of the underperformance of downgraded bonds relative to peers occurs prior to the downgrade actually happening. Therefore, downgrade-related costs primarily affect the index from which downgraded bonds originate.

Downgrade cost can be split between forced liquidation, as the index sells bonds that no longer meet inclusion rules, and the price return of bonds that drop in quality while remaining included in the index universe, or for which a drop in quality hasn't yet been registered. We measure the cost of forced liquidation as the difference in return between "downgrade-tolerant" and actual index returns.

Figure 10 reports downgrade cost across maturity buckets and shows that this negative effect becomes larger as maturity increases up to seven years and remains roughly unchanged beyond that. The cost of rating-based liquidation rules exhibits a similar pattern while the residual cost related to quality changes (bottom row of Figure 10) is more uniform across maturities. Note that this last term captures the effect of a jump from investment-grade to default.

It is expected that downgrade cost increases with maturity as such cost can be described as the product of a spread widening times duration. Yet, spread widening may not be a parallel shift across all maturities. In particular, a lack of demand for long-dated high yield bonds

[9] The relationship between spread levels and spread differential among rating categories is documented in "Try and Hold Credit Investing", Barclays Research, January 2014

[10] See K.Y. Ng and B. Phelps, "Capturing Credit Spread Premium", Financial Analysts Journal, May 2011, A. Ben Dor. and Z. Xu "Fallen Angels: Characteristics, Performance, and Implications for Investors", Journal of Fixed Income, Spring 2011, and also "*Effect of Rating Stop-Loss Rules on Credit Portfolio Performance*", Barclays Research, 2015

can cause long maturity bonds to underperform on a downgrade[11]. Jump to defaults would typically trigger price to expected recovery values with little relationship to the maturity of the bond. Finally, different industry sector allocations in different maturity buckets may introduce significant noise in the effect of downgrades on performance across maturities.

FIGURE 10

Estimated downgrade cost in US IG market (February 1994 to January 2019)

	1-3	3-5	5-7	7-9	9-11	11-20	20-35
Estimated cost of downgrades (bp/y)	**-23**	**-45**	**-52**	**-61**	**-56**	**-60**	**-58**
Cost of rating-based liquidation rule (bp/y)	-6	-12	-28	-26	-19	-25	-24
Residual cost attributed to quality changes (bp/y)	-17	-33	-24	-35	-37	-36	-34

Source: Bloomberg Barclays Bond Indices; Barclays Research

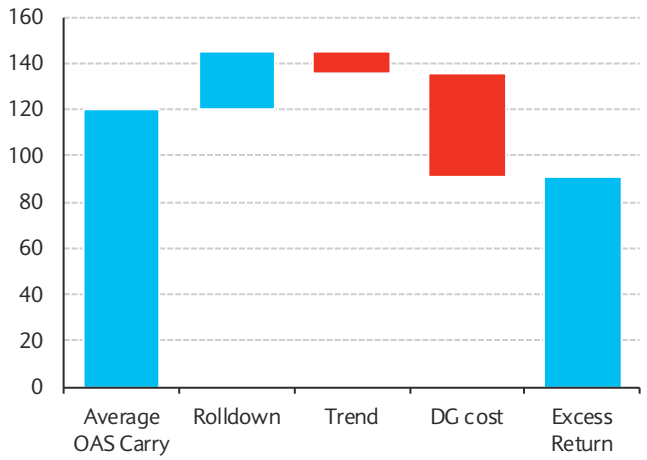
Figures 11 and 12 detail performance contributors for the 3-5 year and 9-11 year maturity sectors. Although the average OAS of the 9-11 year bucket has been higher, it has been penalised by a negative contribution from roll-down return, a factor that is strongly positive in the 3-5 year bucket. The systematic steepening of the spread curve observed in our data sample and larger downgrade costs for longer maturities also affect performance. The net effect is that the 3-5 year bucket delivered 91bp/y of excess return while the 9-11 year bucket return was only 27bp/y on average over the past 25 years.

Similar performance patterns are found in quality subsets of the IG market as shown in Figure 13. A-rated and Baa-rated corporate bonds have both experienced positive spread curve slopes on average, with a dip for the 10-year sector. Differences in roll-down returns across maturities are more pronounced in A-rated indices, with strongly negative returns for the 9-11 year subset. The effect of spread trends is larger for Baa-rated bonds. In both rating categories, excess returns of the longest and shortest maturity buckets would be nearly identical, but inferior to those of the 5-7 year sector, had there been no spread trend in the period considered (see bottom row of the middle section of Figure 13).

The cost of downgrades is smallest for the shortest maturity sector in both universes. It is on average twice as large in the Baa-rated as in the A-rated universe. Indeed, the spread widening observed upon rating downgrade is typically much larger when considering downgrades from Baa to high yield than for rating migration from A to Baa. In the past 25

FIGURE 11

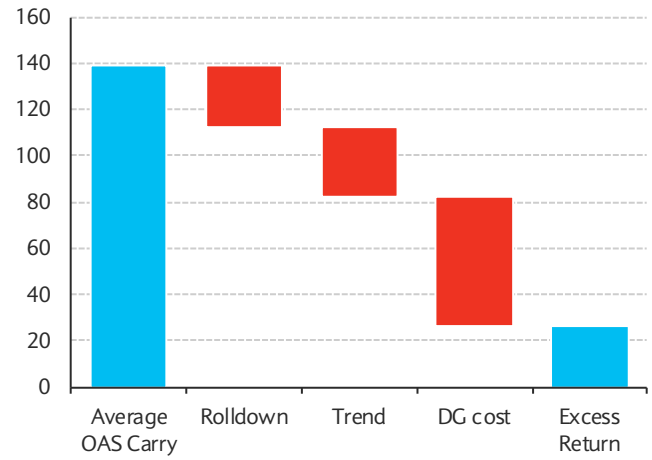
Attribution of excess returns for the 3-5y US IG Corp Index from 1994 to 2019 (bp/y)



Source: Bloomberg Barclays Bond Indices; Barclays Research

FIGURE 12

Attribution of excess returns for the 9-11y US IG Corp Index from 1994 to 2019 (bp/y)



Source: Bloomberg Barclays Bond Indices; Barclays Research

[11] For more details on the duration preferences of high yield investors, see *U.S. Credit Focus: Angels Flirt but Won't Fall*, Barclays Credit Strategy Research 2018.

years, the spread curve hasn't been steep enough to compensate for downgrade losses that also tend to increase with maturity. In addition, for the 9-11 year sector, negative roll-down returns weigh heavily on performance.

In both universes, information ratios decrease monotonically with maturity, with an exception for the 9-11 year sectors, which perform worse than their respective neighbours. Maturity extension beyond seven years has been poorly rewarded in credit markets, for A as well as for Baa-rated bonds.

FIGURE 13

Characteristics and performance attribution of A-rated and Baa-rated maturity buckets (Feb 1994 to Jan 2019)

	A-Rated							Baa-Rated						
Characteristics	**1-3**	**3-5**	**5-7**	**7-9**	**9-11**	**11-20**	**20-35**	**1-3**	**3-5**	**5-7**	**7-9**	**9-11**	**11-20**	**20-35**
Average OAS (bp)	84	100	114	119	110	126	132	140	157	175	183	172	199	197
Average OASD	2	3.6	5.1	6.5	7.5	9.7	12.4	2	3.6	5.1	6.3	7.3	9.4	11.8
Average Spread Slope (bp/y)	8.6	6.9	6.7	-0.8	-5.6	1.1	-0.3	9.5	8.2	7.6	1.5	-1.2	3.2	0.3
Trend Change in OAS (bp/y)	1.1	1.7	2.3	2.5	3	4	3.3	1.7	2.5	3.9	4.1	3.7	5.9	5.7
Average Returns														
Spread Carry (bp)	84	100	114	119	110	126	132	140	157	175	183	172	199	197
Roll-down (bp/y)	16	23	34	-6	-41	11	-5	16	28	39	9	-9	29	1
Spread Trend (bp/y)	-2	-6	-12	-16	-22	-39	-41	-3	-9	-20	-26	-27	-55	-67
Est. Downgrade Cost (bp/y)	-19	-37	-36	-32	-37	-47	-42	-38	-63	-67	-92	-84	-80	-76
Realized ER (bp/y)	**80**	**79**	**100**	**65**	**10**	**51**	**43**	**115**	**113**	**127**	**74**	**53**	**92**	**56**
Excess Return excluding spread trend (bp/y)	82	85	112	81	32	90	84	119	122	147	100	79	148	123
Volatility and I.R.														
StDev ER (bp/y)	163	247	342	384	412	461	648	222	336	454	528	531	667	832
Information Ratio	**0.49**	**0.32**	**0.29**	**0.17**	**0.02**	**0.11**	**0.07**	**0.52**	**0.34**	**0.28**	**0.14**	**0.1**	**0.14**	**0.07**

Source: Bloomberg Barclays Bond Indices; Barclays Research

Risk characteristics of credit steepeners

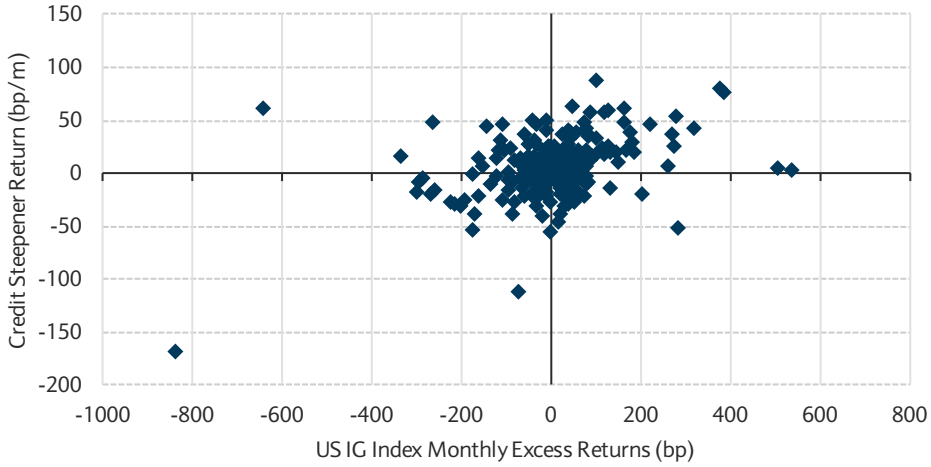
As previous studies have documented[12], we find that systematically overweighting short maturity relative to long maturity corporate bonds is directional on overall credit market performance. For the purpose of illustration, we consider a credit steepener that invests in 3-5 year and shorts 9-11 year corporate bonds on a DTS neutral basis. Note that we do not impose sector or issuer neutrality on this strategy but rather consider all available bonds, as reflected by the index structure.

The scatter chart in Figure 14 illustrates that directionality. Even without the extreme observations related to the 2008 financial crisis (-112bp in September and -169bp in October 2008) it appears that a credit steepening strategy is directional on credit market performance.

[12] See for example Naik, V. M. Devarajan, and E. Wong, "The Anatomy of Credit Curve Trades Over the Economic Cycle", Quantitative Credit Research Quarterly, 2007-Q2", Lehman Brothers Fixed Income Research; Ambastha, M., A. Ben Dor, L. Dynkin, J. Hyman, "Do Short-Dated Corporates Outperform Long-Dated Corporates? – A DTS-Based Study"

FIGURE 14

Monthly returns of 3-5y vs 9-11y credit steepener vs. US IG Corp Index excess returns (2014 to 2019)



Source: Bloomberg Barclays Bond Indices; Barclays Research

Despite the poor performance in crisis times, the steepening strategy has performed well over the past 25 years, with an information ratio of 0.90 (see Figure 15). Similar or lower information ratios are observed for other definitions of the steepening trade for bonds between 3 and 11 years of maturity. The directionality on market variables is similar across all specifications when excluding the period from July to December 2008 from the sample. One should be cautious, however, about a continuation of the performance pattern observed in Figure 15, as corporate spread curves have steepened significantly in the recent past, helping the carry and roll-down of longer dated bonds relative to short dated ones.

FIGURE 15

Performance and directionality of various DTS-neutral credit steepeners (1994 to 2019)

	3-5 vs 5-7	3-5 vs 7-9	3-5 vs 9-11	5-7 vs 7-9	5-7 vs 9-11	7-9 vs 9-11
Average Return (bp/m)	2.4	5.7	6.4	5.5	7.0	2.2
StDev (bp/m)	17.3	23.1	24.5	20.0	31.9	28.7
Annualised I.R.	**0.47**	**0.86**	**0.90**	**0.96**	**0.76**	**0.26**
Correlation with market variables						
Credit Index ER	-0.11	0.14	0.39	0.38	0.52	0.38
SPX price return	-0.01	0.04	0.18	0.09	0.22	0.22
Change in VIX	-0.02	-0.14	-0.27	-0.22	-0.29	-0.21
Change in 10y Tsy yield (bp)	-0.02	0.02	0.12	0.08	0.16	0.14
Change in 2-10y Tsy slope	0.05	0.05	0.08	0.01	0.04	0.05
Correlation with market variables (excluding July to December 2008)						
Credit Index ER	0.10	0.27	0.34	0.35	0.38	0.17
SPX price return	0.14	0.16	0.18	0.11	0.14	0.10
Change in VIX	-0.23	-0.27	-0.26	-0.21	-0.17	-0.04
Change in 10y Tsy yield (bp)	-0.03	0.03	0.12	0.09	0.19	0.15
Change in 2-10y Tsy slope	0.17	0.10	0.06	-0.03	-0.06	-0.04

Source: Bloomberg Barclays Bond Indices; Barclays Research

Conclusion

Long maturity corporate bonds have delivered lower excess returns than short maturity ones in the past 25 years. Our attribution analysis reveals that this underperformance can to a large degree be explained by roll-down and downgrade-related returns, alongside sample-specific trend in spreads. The effect of all three factors varies significantly depending on maturity.

Variations in roll-down returns reflect the relative steepness of issuer spread curves across maturity sectors. While spread curves have generally been steeper in short maturities than in longer ones, they have been flat or inverted in the ten-year sector, which has delivered particularly poor roll-down returns. This can be associated with the negative liquidity spread premium of the ten-year sector, in which much new issuance is concentrated. The costs of rating downgrades are also generally larger for longer maturity bonds.

Accordingly, "credit steepening" strategies that overweight short relative to long-dated credit have performed well. But their performance is directional on the credit market and on traditional risk aversion indicators.

The performance pattern observed in the past 25 years might not persist in the near future. Following significant steepening of the spread curve, the average spread of long maturity corporate bonds is now substantially higher than that of short-dated ones, and it is unclear whether the steepening observed in our study sample can continue in the future.

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