Time dynamics of credit active returns

- When is issuer selection in credit portfolios more important than sector rotation or market timing? What alpha can be expected from each of these strategies from a manager with reasonable skill given the market environment? How should they be combined into an optimal portfolio? Is there an ex-ante approach to deciding what regime corresponds to the current market environment?
- We study strategy performances over time through a historical simulation of investor skill in Barclays US IG Corporate Bond Index universe. Active returns in credit mandates can be typically attributed to issuer selection, sector rotation, and market timing strategies.
- We find that market-wide spread level is a dominant factor driving active returns as spreads directly relate to active risk. But other factors such as the distribution of market risk across systematic and idiosyncratic factors are at play.
- Issuer selection takes precedence over sector allocation when cross-sectional dispersion of excess returns is elevated. In such regimes (eg, 2000 to 2003), excess returns of corporate bonds are not well explained by a small number of risk factors that work well in times when systematic risk dominates such as 2010-2013. We find that the value of issuer selection dropped by over a third while the value of macro credit positioning increased by over a third from the first to the second of these two periods.
- As the market environment changes over time, so do expected returns of credit strategies. This should encourage investors to adjust performance targets and strategy utilization according to prevailing market conditions.
- Predicting issuer-specific risk, and hence the value of issuer selection given a certain level of skill, can be attempted using a Policy Uncertainty Index[1] in addition to spreads, but we find the relationship with such an index to be weak and relatively unstable over time.

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[1] See Baker S.,N. Bloom and S. Davis and www.policyuncertainty.com

Introduction

Investors often set performance targets for active managers based on an assessment of information ratio and active risk budget over a significant time horizon. These targets are generally adapted to the risk profile of the asset class and characteristics of the investment universe. Indeed, active returns are intrinsically linked to active risk. However, in credit markets, risk changes substantially over time, largely as a function of spreads but also of other factors and this can have significant implications on the performances of active managers. Therefore, should credit investors adjust performance targets according to prevailing market conditions as well as to the risk profile of relevant benchmark indices?

We explain how active risk and alpha of credit strategies change over time using historical simulations with imperfect foresight[2]. We consider three strategies: credit market timing, sector rotation, and issuer selection in the context of a market index of corporate bonds. So, market timing involves buying or selling credit in proportion of the index holding. Sector rotation requires transferring exposure from one major index sector to the other. Issuer selection means concentrating the portfolio in a relatively small number of issuers while remaining neutral in terms of broad market exposure. All strategies relate to excess returns, assuming that rates risk is always neutralized. We observe how simulated strategy risk and alpha change over time, given the realised performances and risk properties of the corporate index. Historical simulation results are compared with information ratios and alphas estimated according to the popular "Fundamental law of active management"[3].

Early intuition on the relative importance of individual strategies over time can be obtained from a historical analysis of the cross-section of credit excess returns, decomposing corporate bond excess returns into systematic and issuer-specific (idiosyncratic) components. Times of elevated macro, systematic risk can be characterized by relatively low idiosyncratic risk and relatively higher explanatory power of systematic factors. Such times are generally more supportive of macro allocation than issuer selection strategies.

We estimate expected alpha over time for our three generic strategies and study efficient strategy combinations. We discuss implications for credit managers striving for an efficient use of risk budget as well as for asset owners evaluating the potential contribution of active credit management in various environments.

[2] Our foresight strategies are designed consistently with our previous studies, including *Value of Skill in Macro Strategies for Global Fixed Income Investing*, Barclays Research, February 2010 and *Value of Skill in Security Selection versus Asset Allocation in Credit Markets*", Dynkin L. et al Journal of Portfolio Management, Fall 2000

[3] See Active Portfolio Management, Grinold R. and R. Kahn, McGraw Hill

Explaining the structure of index excess returns

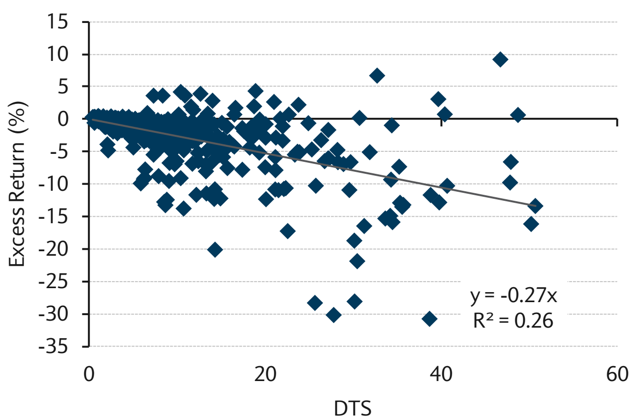
A simple historical analysis of realized excess returns can provide an indication of the importance of different active credit strategies. How much issuer excess return can be explained by systematic factors? How much is sector-specific or issuer-specific? We take the top 500 issuers by market value represented in the Barclays US Investment Grade Corporate Index and contrast the cross-sectional distribution of their excess returns over Treasuries for the months of July 2002 and November 2011, as plotted in the scatter charts of Figure 1.

FIGURE 1

The dispersion of credit excess returns changes over time

PANEL A

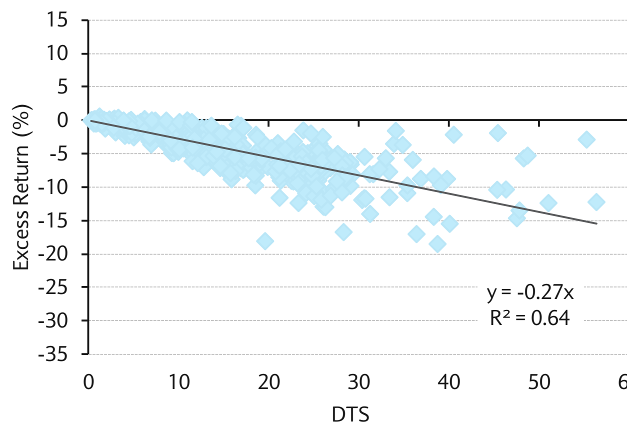
Excess returns vs. DTS in July 2002



Source: Barclays Research

PANEL B

Excess returns vs. DTS in November 2011

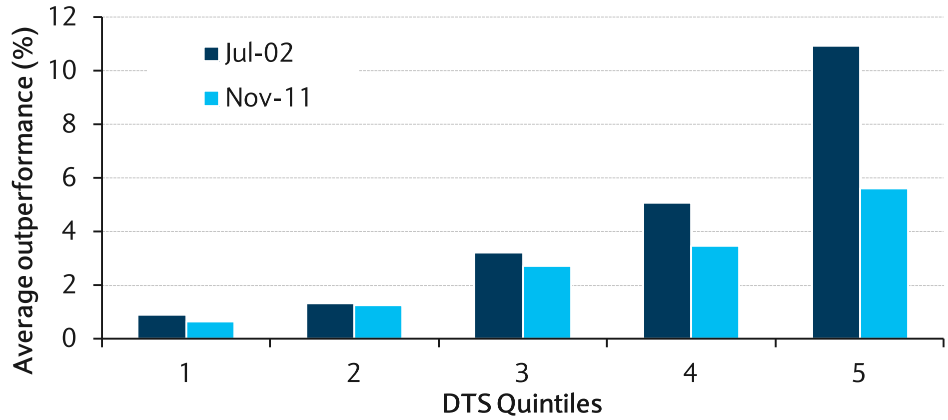


Source: Barclays Research

There is a clear linear relationship between Duration Times Spread (DTS)[4] and excess returns in both months. However, the dispersion around the linear relationship is substantially higher for July 2002 than November 2011, although the average percentage change in spread is the same (27%) and the index excess returns are very similar (-2.93 and -2.88%, respectively) in both months. This indicates that a systematic market factor explained individual issuer returns better in November 2011 than in July 2002, when it was more important to discriminate between issuers.

[4] For an introduction to DTS, see *DTS (Duration Times Spread): A New Measure of Spread Exposure in Credit Portfolios*, Dynkin et al, Journal of Portfolio Management, Winter 2007

FIGURE 2
Average outperformance of above-median vs below-median issuers split by DTS quintiles



Source: Barclays Research

This is illustrated in Figure 2, which plots the average difference in excess return between issuers with above-median returns and those below the median for various DTS quintiles. Clearly, the performance advantage of selecting a winning issuer was much greater in the first month than in the latter.

The return analysis shown in Figure 1 can be expanded to highlight the relative importance of a systematic market factor, sector effects, and issuer-specific returns over time. For this, we run cross-sectional regressions analysis of monthly excess returns of index issuers.

First, we attribute issuer excess returns to a single systematic market factor corresponding to the overall change in credit spread in a given month. The cross-sectional regression for this attribution can be written as equation (1) below. It splits the excess return of issuer *i* into a systematic component explained by the market factor and a residual term. The exposure to the market factor is expressed in terms of DTS contribution. This implies that the market factor represents a common relative spread change across the index universe.[5] As we attempt to explain the realized monthly excess returns of the index, issuer excess returns are weighted according to their respective index weights.

$$MW_i \times ER_i = F_{market} \times MW_i \times DTS_i + \varepsilon_i \qquad (1)$$

Next, we try an alternative, sector-based model. In this second model, we attribute issuer excess returns to a set of sector-specific factors, corresponding to proportional spread changes of various industry sectors. If we consider *n* different industry factors, the regression specification becomes (2)

$$MW_i \times ER_i = \sum_{j=1}^{n} F_{industry(i)=j} \times MW_i \times DTS_i + \varepsilon_i \qquad (2)$$

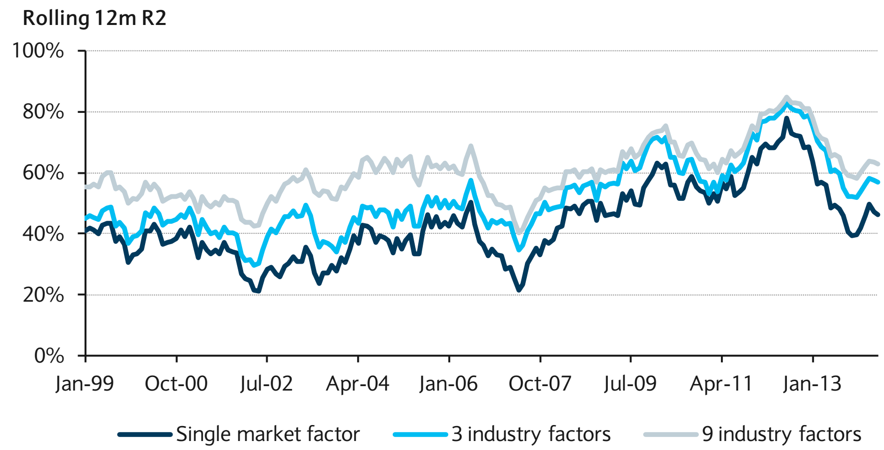
We can compare the explanatory power of a single market factor model with multiple industry-specific factor models, and on that basis assess the attractiveness of granular sector allocation vs. timing the entire market performance. This is shown in Figure 4, which displays rolling R-squared for three regression specifications: a single factor, three major industry factors, and nine granular industry factors.

[5] The advantage of the DTS-based formulation is that even when using a single market factor, the model assumes that in a secular widening of spreads, the amount of spread widening in each issuer is proportional to the initial spread.

The explanatory power of all three models peaked in 2012. The incremental explanatory power of granular factor specifications over the single factor model has also been small in recent years which were characterized by significant swings in risk-aversion: the "risk-on, risk-off" regime. The gap between the R-squared of multi and single factor regression was much wider in 2000-2003 than in 2010-2013. In short, regression analysis indicates that the past couple of years were a time of elevated systematic risk that required active managers to demonstrate macro allocation skills, while in previous years, granular sector allocation and issuer-selection had higher relative importance in the alpha generation process.

FIGURE 3

How well can a one-, three- or nine-industry factor model explain excess returns of the corporate index?

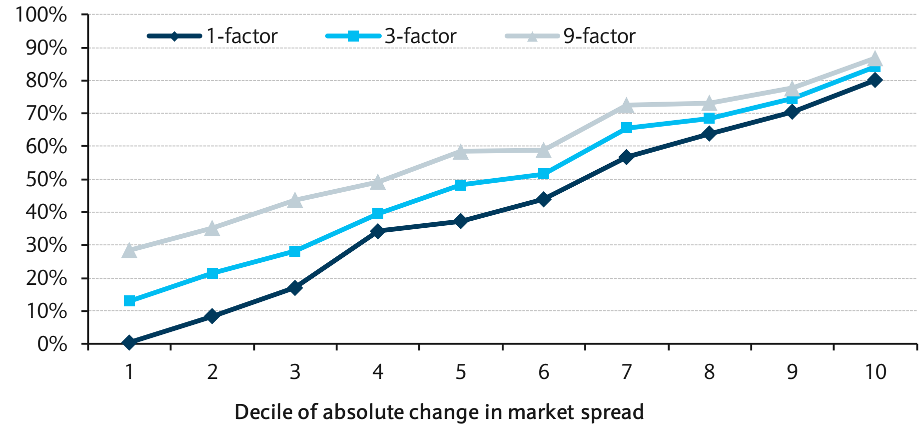


Source: Barclays Research

Note that including additional industry factors helped improve explanatory power nearly as much in the relatively calm period of 2004-7 as in the dotcom era of 2000-3. Does the incremental explanatory power depend on the amount of systematic spread change in a given month? To test this, we partitioned our data sample into deciles of absolute change in spread, and measured the average R-squared of our one, three and nine-factor risk models within each decile. The results, shown in Figure 4, indicate that when absolute market spread changes are larger, overall explanatory power is larger for all model specifications, and the relative advantage of adding more factors decreases.

FIGURE 4

Average regression R-squared by decile of absolute change in market spread



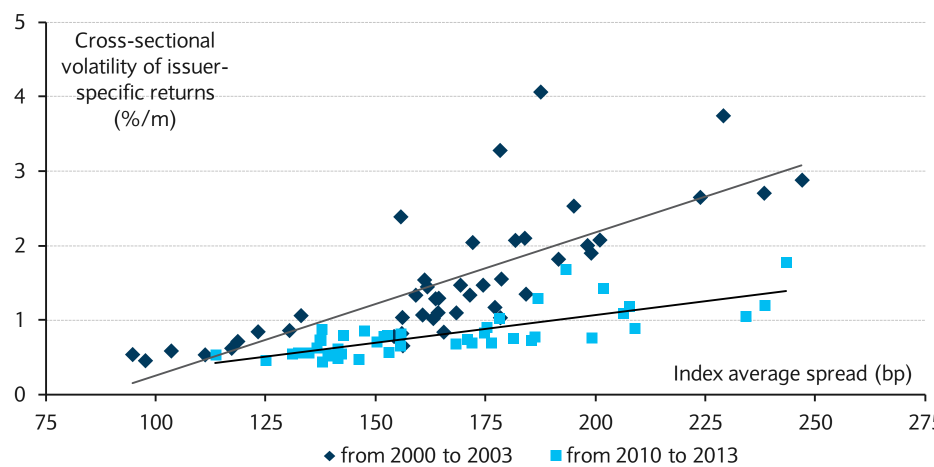
Source: Barclays Research

The behaviour of regression residuals is of particular interest since they correspond to pure, issuer-specific performance. Indeed, issuer selection strategies aim to exploit the volatility of idiosyncratic returns and issuer-selection skill is better rewarded when that volatility is high.

We know from our studies of DTS that there is a strong linear relationship between spread levels and idiosyncratic spread volatility. However, this relationship is not constant over time. Figure 5 shows that issuer-specific volatility was substantially higher in 2000-2003 than in 2010-2013, despite both periods having nearly identical average spreads. Each dot in Figure 4 represents the cross-sectional volatility of regression residuals for the nine-factor regression model.

FIGURE 5

Monthly issuer-specific volatility vs. average index spread for two periods



Source: Barclays Research

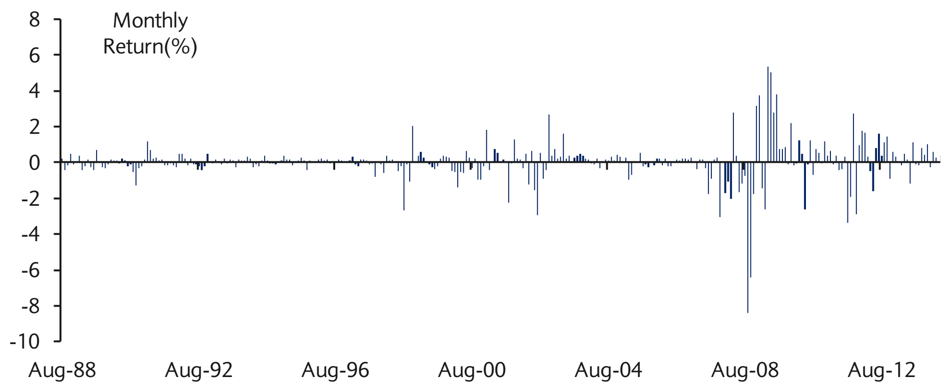
Continuing our analysis of the US corporate bond market, we simulate active strategies that exploit market timing, sector rotation and issuer selection on a monthly basis.

Timing macro credit exposure

The first and most simple active strategy that we simulate consists of over or under-weighting overall credit exposure according to macro directional views on the asset class. In its simplest form, timing macro credit exposure requires buying corporate bonds and selling Treasuries or vice versa every month and can be represented as being long or short the excess return over duration-matched Treasuries of the Barclays IG Corporate Bond Index. Figure 6 provides an overview of historical index excess returns and illustrates how their volatility changed over time.

FIGURE 6

Historical excess returns of Barclays IG Corporate Bond Index



Source: Barclays Research

To assess the value of this macro strategy, we simulate a hypothetical manager with imperfect foresight who, every month, allocates exposure to the index excess return. Foresight means that the manager exhibits skill at anticipating market direction. For example, a 10% skill means that the probability of overweighting credit exposure in a month with positive excess return is 55%, and the probability of incorrect positioning is 45%. An unskilled manager has a 50% probability of correctly anticipating market direction.

A systematic macro timing strategy can be implemented in various ways. For example, active allocation can be defined in terms of market weight (MW), or of contribution to DTS[6], or in terms of expected tracking error volatility (TEV). We study these three alternatives in our historical analysis. In the first case, the strategy's active position is set to a constant 10% of the index market value. This means that we assume that the portfolio's active weight to credit will be either +10% or -10% in market value terms, depending on the directional view of our skilled manager. In the other three cases, the sizing of the active position will be adjusted to try to maintain a constant level of risk. In the second case, the strategy active exposure is assumed to be set to one unit of DTS contribution. If all index bonds have 5 year duration and trade at 200bp spread over Treasuries, the index DTS is 10, and a DTS contribution of +/-1 is equivalent to a market weight of +/-10% of the index. When index DTS is higher (lower), a smaller (larger) active weight in market value terms will be required to achieve the same DTS contribution. As excess return volatility is known to be proportional to DTS, this way of defining exposure is expected to result in a more stable active risk budget over time than a market-weight based allocation. In the third and fourth cases, we use a DTS-based model to estimate portfolio TEV by multiplying DTS

[6] This tracking error volatility is estimated by multiplying the current index DTS with the standard deviation of proportional changes in index spread measured from a rolling 12- or 36-month historical time window.

contributions by an estimated proportional spread volatility for the entire index, using a sliding window of the most recent 12 or 36 monthly observations. The credit overweight corresponding to 10bp/mo in TEV space would be equivalent to a DTS contribution of 1 if the relative spread volatility were estimated to be 10%/month. Thus the implementation based on a constant DTS contribution can be considered to be a variation of the TEV-based constraint with a constant volatility assumption, while the rolling-window TEV allocations attempt to improve on this by projecting relative spread volatility based on the recent past. Figure 7 shows hypothetical manager performance for each of these implementation approaches, assuming 10% skill at timing the index excess return every month since 1996.

FIGURE 7

Timing Barclays Corporate Bond Index excess returns with 10% skill

Sep 1996 – Apr 2014	MV (+/- 10% MW)	DTS (+/- 1 DTSC)	TEV (10bp/mo) (12-mo rolling)	TEV (10bp/mo) (36-mo rolling)
Avg (bp/y)	9.5	9.0	11.0	9.6
Stdev (bp/y)	47.4	37.2	48.8	42.7
IR	0.20	0.24	0.23	0.23
Excess Kurtosis	10.4	4.6	7.7	8.9
Skewness	-1.1	-1.6	-2.1	-2.3

Source: Barclays Research

Results of historical simulations can be contrasted with the theoretical estimates calculated under the assumption of Gaussian excess returns. It is possible to show that the annualized information ratio (IR) of an active strategy is a function of manager's skill and the square root of breadth, the number of independent active decisions per year.

$$IR = \sqrt{\frac{2}{\pi}} \times Skill \times \sqrt{Breadth} \tag{3}$$

The value of skill can then be represented as annualised active return, or alpha, which is function of the active risk budget, or tracking error volatility (TEV) allocated to the strategy.[7]

$$\alpha = TEV \times \sqrt{\frac{2}{\pi}} \times Skill \times \sqrt{Breadth} \tag{4}$$

For a 10% skill applied at a monthly horizon (12 times a year), equation (3) predicts an information ratio of 0.28. This contrasts with our historical simulations (see Figure 7) which produce information ratios between 0.20 and 0.24. The lowest simulated IR corresponds to the manager reallocating based on market weight. As the excess return volatility of the index varies with spreads, a unit exposure of market value translates into much higher active risk when spreads are high than when they are low. As a consequence, the strategy that allocates in terms of market weights is characterized by high kurtosis and inferior information ratio[8].

[7] Equations (3) and (4) repeat the "Fundamental Law of Active Management" formulated by Grinold and Kahn with a small adjustment for the different definition of skill. In the "Fundamental Law" skill is defined as the correlation between manager forecast and subsequent market realization and called "information coefficient" while we define skill as the excess probability of correctly anticipating market direction (ie, an excess hit ratio).

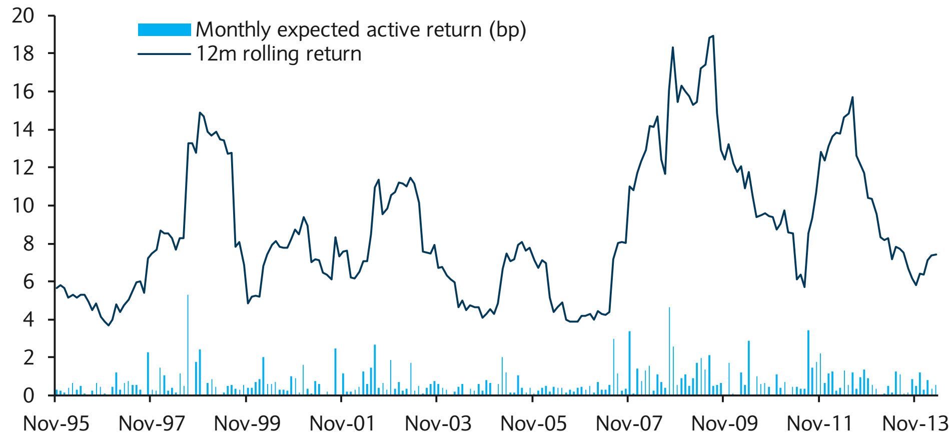
[8] The reason is simple: if a time series of simulated strategy returns includes two sub-periods, one volatile and one relatively quiet, the total volatility of the time series is dominated by the volatile sub-period while the total return is just the average returns of both periods with, given constant skill, the quiet period experiencing lower returns than the volatile one. In this case, the information ratios of both sub-periods taken in isolation are larger than the information ratio for the overall time window. Perhaps a more intuitive explanation is that if the size of the strategy active position is not reduced when market volatility is high, the strategy might experience a loss out of proportion with the gains accumulated over time, when market volatility is low. Such potential outsized loss can reduce the strategy long-term cumulative performance, increase volatility and accordingly reduce information ratio.

Surprisingly, the strategy scaled according to DTS contributions delivers a higher IR than the ones scaled according to expected TEV. Estimating proportional spread volatility dynamically did not add value over assuming a constant volatility.

How does strategy performance vary over time? In any given month, our assumptions of 10% skill and symmetric active positioning implies that each month there is a 45% probability of underperforming and a 55% of outperforming by the same amount. As a result, the expected active return is always positive, but varies over time based on the magnitude of the credit index excess return and the position size taken. Figure 8 shows the fluctuation of expected active returns for the most stable of the strategies considered, based on constant DTS contributions.

FIGURE 8

Expected active returns from timing Corp Index excess returns with 10% skill; active exposure set to 1 unit of DTS



Source: Barclays Research

Timing sector rotation

Sector rotation differs from macro timing in that a broader variety of decisions are possible depending on the number of sectors to allocate to. We formulate the strategy as follows: sectors are over or under-weight according to imperfect foresight, much as in the macro strategy in the previous section. Taking the three broadest industry sectors (Financial, Industrial and Utility), we represent sector rotation as over/under-weighting one out of the three sectors versus the other two. The strategy is DTS neutral to avoid directionality on overall market performance and shifts pre-defined amounts of DTS contribution across the three sectors as shown in Figure 9. The allocation to any of the three decisions is based on imperfect foresight. Without skill, we assume there is an equal probability of selecting any of the three decisions. With perfect foresight (100% skill), the probability of choosing a losing decision is nil. Intermediate levels of skill can be represented by interpolating allocation probabilities between the unskilled and perfect foresight cases as shown in the last three column of Figure 9[9].

[9] This particular formulation considers skill at selecting a winning sector, not the highest returning sector. Thus, in the example shown in Figure 9, even at 100% skill we do not assume that the manager will overweight Financials, but rather has a 50% chance of having chosen each of the two sectors with positive excess returns.

FIGURE 9

Sector selection strategy with foresight – Example for January 2013

	Net exposure (DTS contribution)			MV Over/Underweight			Return (bp)	Prob – 0% skill	Prob – 100% skill	Prob – 10% skill
Strategy	IND	UTI	FIN	IND	UTI	FIN				
Long IND	1	-0.5	-0.5	10.0%	-3.9%	-5.8%	-5.5	33%	0%	30%
Long UTI	-0.5	1	-0.5	-5.0%	7.8%	-5.8%	0.7	33%	50%	35%
Long FIN	-0.5	-0.5	1	-5.0%	-3.9%	11.6%	4.8	33%	50%	35%
Active Return (bp)								0	2.7	0.3

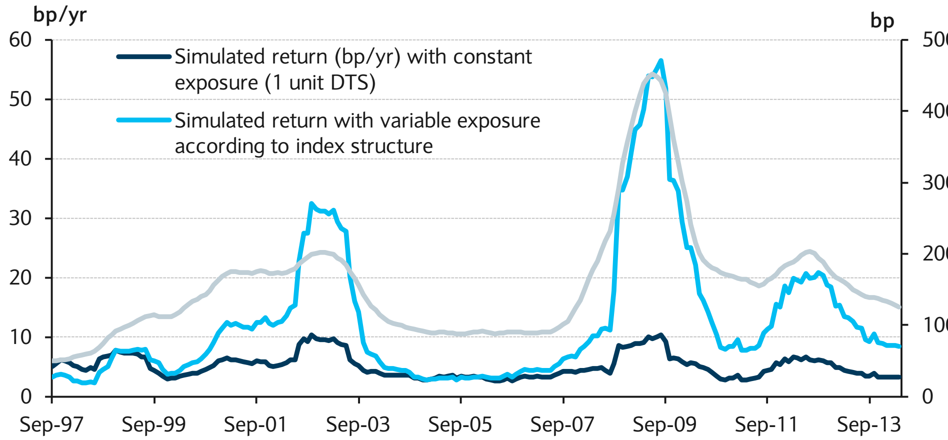
Source: Barclays Research

Making sector rotation DTS neutral imposes a limit on risk allocation to the strategy unless one is able to implement net short positions and underweight individual sectors by more than their benchmark index weight. This means that in a low spread environment, as in 2005 and 2006, it might be challenging to implement a sector rotation strategy that shifts even one unit of DTS contribution. On the other hand, when spreads are high, significant re-allocation of DTS exposure is possible. In Figure 10, we contrast the active returns provided by a constant DTS contribution strategy with active returns where exposure is variable and scaled up according to the structure of Barclays US Corporate Bond Index. In this analysis, our simple sector strategy is heavily constrained by individual sector weights in the index. Indeed, maintaining overall DTS neutrality requires that the DTS contribution of overweight sectors matches that of underweight sectors. If a sector weight is small, the (long-only) strategy cannot underweight exposure to that sector very significantly and this limits the exposure taken in other, overweight sectors. For example, the strategy exposure could be three times as large in early 2003 as at the end of 2004. In practice, however, sector strategies could be defined opportunistically, with no particular requirement to maintain a symmetric allocation of active exposure across all overweight or underweight sectors.

While the constant DTS strategy delivers higher information ratios but modest active returns, the variable exposure strategy can provide high active risk and active returns in times of elevated spreads but has a lower information ratio. Indeed, time-varying risk allocation inflates overall strategy volatility and accordingly reduces information ratio.

FIGURE 10

Simulated return (12-month rolling average) of sector allocation strategy (three major sectors, 10% skill)



Source: Barclays Research

Comparing simulated alphas of market timing (Figure 8) and of sector rotation (Figure 10), we find that for one unit of DTS, the expected alpha of the market strategy is larger and reaches almost 20bp/year while, for the same active exposure, sector rotation which is less risky given it implements relative views, delivers alphas of at most 10bp/year. The much higher alphas of up to 50bp/year shown in Figure 10 for sector rotation according to index structure are based on the limiting strategy that implements directional views in a maximal way, often by dropping the weights of some sectors to zero. A more realistic sector rotation policy might be defined that maintains this variable exposure approach but reduces the active positions to some fraction of those in this extreme example.

The level of spread is a major driver of strategy risk and active returns but does not explain them fully. A second variable affecting performance of the sector rotation strategy is the average correlation between excess returns of individual sectors. When pair-wise sector correlations are low, there is increased potential for generating active risk by shifting exposure from one sector to the other. When correlations are high, different sectors are close substitutes and managing directional market risk is relatively more important. This is illustrated by comparing two sub-periods with identical average spreads: 2000 to 2003 and 2010 to 2013. The average pair-wise sector correlation in the earlier period was 69% but increased to 94% in the second period. Figure 11 provides statistics for these two sub-periods in addition to the evolution of active risk, return and correlation of an example sector allocation strategy.

FIGURE 11

Active risk, return and average pairwise sector correlation for the sector allocation strategy (three sectors, one unit of DTSC and 10% skill)

	1996 to 2013	2000 to 2003	2010 to 2013
Active Return (bp/y)	**5.1**	**6.4**	**4.4**
Standar Deviation (bp/y)	20.9	28.3	14.2
IR	0.25	0.23	0.31
Average Correlation	83%	69%	94%

Source: Barclays Research

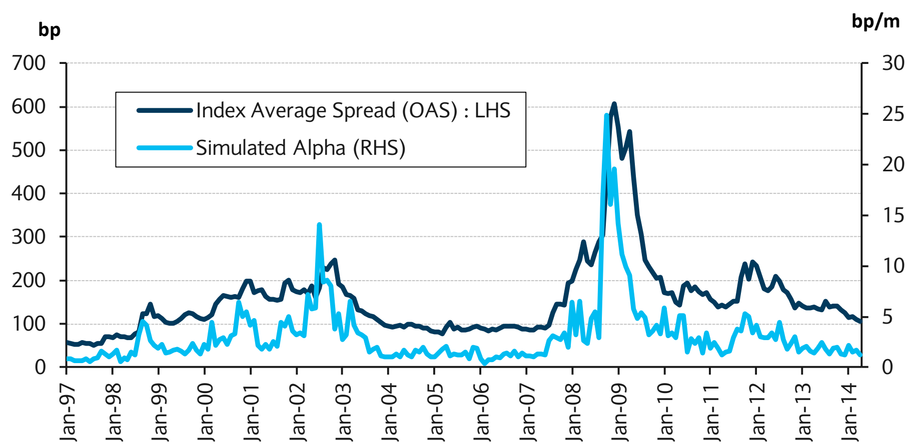
Issuer selection

Having described macro and sector allocation strategies, we now model issuer-selection strategies that concentrate a credit portfolio on a limited number of issuers selected with imperfect foresight. For this, we simulate portfolios that invest in a pre-determined number of issuers with skewed probability of picking winners. Imperfect foresight is reflected in the probability of selecting issuers with positive idiosyncratic excess returns, as measured by regression residuals obtained in the previous section. The strategy samples from the largest 200 index issuers and allocates an equal DTS contribution to each selected issuer while matching the overall index DTS. We run 1000 simulations every month to obtain cross-sectional distributions of issuer-selection strategy returns.

As simulated portfolios match the DTS of the corporate index, the DTS contribution of each issuer is not stable over time: for a portfolio of 20 issuers, the DTS contribution of a single issuer is 1 when the index DTS is 20 (as in mid-2009) and 0.25 when the index DTS is 5 (as in early 2005). Therefore, issuer-specific risk and alpha change over time, essentially as a function of market spreads, as illustrated in Figure 12. One should note that the value of skill in issuer selection and sector rotation strategies is bound to be a function of spread, with little capacity to generate active risk in a low spread environment. This is less the case for market timing, where significant active risk can be generated from relatively modest DTS exposure.

FIGURE 12

Average spread of Barclays Corporate Index and simulated issuer-selection alpha (20 issuers, 5% skill)



Source: Barclays Research

But, as we saw in Figure 5, issuer-specific spread volatility is not constant and so spread levels, although a dominant factor in explaining credit risk, do not fully explain the performance of simulated active credit strategies. In Figure 13, we show the results of issuer selection strategies for various levels of skill, time windows and levels of portfolio concentration. As in other strategies, we find a linear relationship between skill and information ratios as long as skill is not extremely high.

FIGURE 13

Historical simulations of issuer-selection strategies

Panel A: 20 issuer portfolio	5% Skill	10% Skill
	1996 to 2013	
Alpha (bp/y)	37	74
StDev (bp/y)	96	97
IR	0.38	0.75
	2000 to 2003 (Avg OAS: 164 bp)	
Alpha (bp/y)	49	97
StDev (bp/y)	112	112
IR	0.43	0.87
	2010 to 2013 (Avg OAS 163 bp)	
Alpha (bp/y)	31	64
StDev (bp/y)	64	64
IR	0.49	1.00
Panel B: 50 issuer portfolio	**5% Skill**	**10% Skill**
	1996 to 2013	
Alpha (bp/y)	37	74
StDev (bp/y)	59	62
IR	0.62	1.20
	2000 to 2003 (Avg OAS: 164 bp)	
Alpha (bp/y)	48	95
StDev (bp/y)	68	68
IR	0.70	1.39
	2010 to 2013 (Avg OAS 163 bp)	
Alpha (bp/y)	33	66
StDev (bp/y)	40	40
IR	0.82	1.65

Source: Barclays Research

Given their much larger breadth, issuer selection strategies can deliver higher information ratios than macro strategies even at lower levels of skill. However, generating significant active market risk in issuer selection may be challenging in low spread environments, even when the portfolio is quite concentrated. So, a systematic bias towards overweighting credit can help exploit the typically high risk-adjusted performance of issuer-based strategies, especially in a low spread environment[10].

Active returns over time

As shown in the previous sections, the potential for implementing active risk and therefore for transforming skill into active return changes over time. The main constraints to implementing active risk in a long-only portfolio relate to the level of spreads, the index structure, as it is not possible to underweight beyond the allocation of a benchmark index, and the volatility of systematic and idiosyncratic spread changes. The contribution of issuer selection strategies is relatively smaller when a larger share of index issuer returns is explained by common factors, as in 2010-2013.

[10] For a discussion of the effect of security selection skill on optimal sector allocation, see chapters 24 and 25 of *Quantitative Management of Bond Portfolios*, Dynkin L. et al, Princeton University Press 2007

The value of an assumed constant skill in our three active strategies is illustrated in Figure 14 for four main sub-periods of our historical analysis: the early 2000s, which includes the crisis in telecom and utility industries; the relatively stable, low spread episode between 2003 and 2007; the credit crunch between 2007 and 2009 with liquidity shocks, inducing extremely high spreads and excess return volatility; and 2010-2013, characterized by central bank activism and swings in risk aversions. For each sub-period, we report average index spread, strategy volatility and strategy simulated returns, given an assumed constant skill.

For all strategies, the active risk that can be generated each month is derived from assumed exposure limits. For issuer selection, we assume the portfolio invests in 20 issuers, with an equal allocation of DTS contribution to each issuer and with the sum of DTS contributions equal to the Corporate Index DTS. For sector rotation, we assume a DTS-neutral strategy scaled according to the prevailing structure of the index; the maximum underweight to a sector is that sector exposure in the index. In timing directional exposure to the market excess return, we consider re-allocating 10% of the index exposure. This delivers lower information ratios than re-allocating a constant DTS contribution, but it may be more realistic in a fully funded bond portfolio to assume that the sizes of active positions will depend upon the structure of the index[11]. Figure 14 presents a summary of simulated strategy performance during different sub-periods.

FIGURE 14

Value of skill over time for active credit strategies: output of historical simulations

		Issuer selection (5% skill – 20 issuers)	Sector rotation (10% skill)	Market timing (10% skill – 10% of index)
1996 to 2013	Avg Alpha (bp/yr)	37.1	12.6	9.6
	Volatility (bp/yr)	96.4	67.8	47.8
	Information Ratio	0.38	0.19	0.20
2000 to 2003	Avg α (bp/yr) (Avg Index OAS : 164bp)	48.5	16.0	8.0
2004 to 2007	Avg α (bp/yr) (Avg Index OAS : 94bp)	15.1	3.5	2.7
2007 to 2010	Avg α (bp/yr) (Avg Index OAS : 296bp)	80.0	28.9	25.0
2010 to 2013	Avg α (bp/yr) (Avg Index OAS : 163bp)	31.4	12.8	11.0

Source: Barclays Research

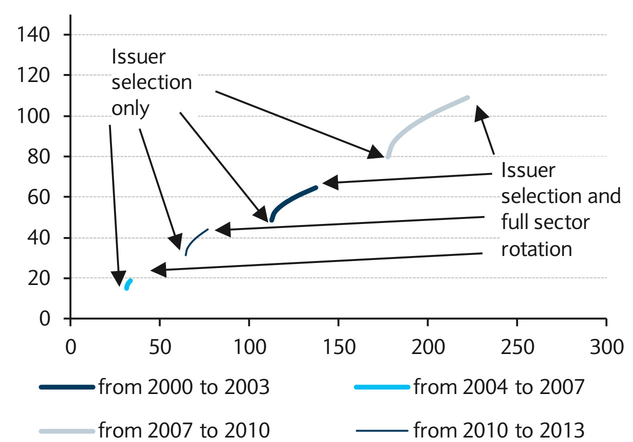
The charts in Figure 15 illustrate the relationship between alpha and tracking error volatility for the four different periods and various combinations of the strategies shown in Figure 14. All curves of Panel A of Figure 15 assume that issuer selection (20 issuers and 5% skill) is always fully exploited while the sector rotation strategy exposure varies from zero to the maximum permissible given index allocation and long-only constraints. In Panel B, we add a varying exposure to the market timing strategy. The range of risks and returns varies substantially over time, with index spread a major driver. According to our simulations, the quiet years of 2004-2007 offered only modest opportunities for adding value through active

[11] Defining strategy exposure in terms of an ex ante risk budget or a fixed DTS contribution could lead to turnover just as a consequence of changes in market condition rather than changes in active views, and the predefined risk exposure might be hard to implement in times of low spreads. We generally find that targeting a constant active risk exposure over time is better suited to portfolios that can use liquid instruments.

management. On the other hand, the volatile period of the credit crunch allowed for significant risk taking, and hence potential added value. In between, we contrast two sub-periods with identical average spreads (2000 to 2003 vs. 2010 to 2013) but different simulated strategy returns. Issuer selection (from 49 to 31bp/yr) and sector rotation (from 16 to 13bp/yr) have lower returns in the most recent period while market timing returns increase (from 8 to 11bp/yr). It is striking that, in Panel A of Figure 15, the curves that represent combinations of issuer selection and sector rotations in both periods for identical skills and intended exposures are located in different parts of the charts.

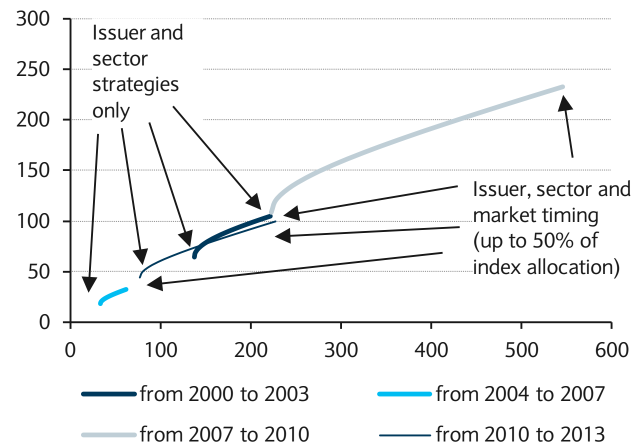
FIGURE 15
Simulated returns and active risks of active strategies in different time periods

PANEL A
Combining issuer and sector strategies



Source: Barclays Research

PANEL B
Adding macro timing strategy

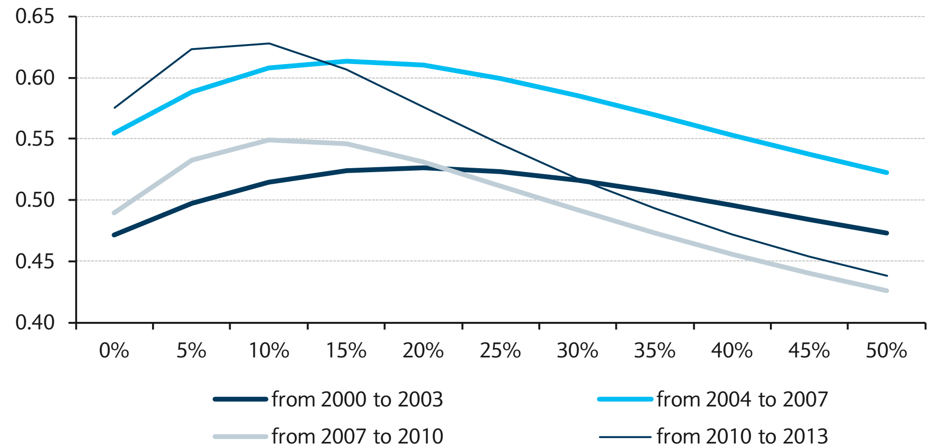


Source: Barclays Research

The slopes of the strategy combination curves in different periods are relatively similar and correspond to strategy information ratios which are essentially a function of skill and breadth. In our simulations, the issuer selection strategy has a higher IR, with higher breadth more than compensating for lower skill, than sector rotation and market timing and therefore appears as a superior strategy. Adding sector or macro strategies to issuer selection beyond a certain point actually reduces portfolio information ratios, as shown in Figure 16 where the leftmost points of each curve represent full allocations to issuer and sector strategies for each period. In the recent period of elevated systematic risk and relatively low idiosyncratic spread volatility, the IR maximizing allocation to the market timing strategy is lower than in the previous three periods. But at the same time, the potential for active returns of issuer and sector strategies is relatively small in that period. Maximizing IR is only possible for a modest return target, lower than expected given market spreads and requires a small allocation to the macro timing strategy. Maximizing returns requires more reliance on market timing at the cost of a potential reduction in IR. However, portfolio IR is very quickly reduced when over-relying on the macro strategy, and more so in 2010-2013 than in previous periods, as shown by the steeply downward sloping curve in Figure 16. So, while it might be tempting to compensate the lack of alpha of granular strategies with an increased allocation to macro views, it would be safer to keep active risk commensurate with expected strategy IRs and accept that credit portfolio alpha cannot be expected to be high when spreads are low and when systematic risk dominates market performance.

FIGURE 16

Maximizing information ratio by adding market timing to issuer and sector strategies

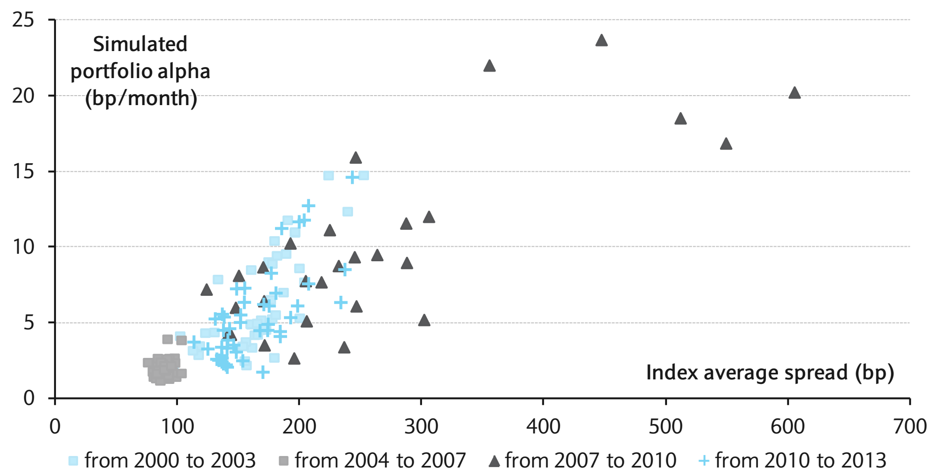


Source: Barclays Research

In Figure 17, we illustrate the relationship between spread and alpha for a hypothetical portfolio of strategies that fully exploits issuer selection and sector rotation but limits exposure to market timing to 20% of the overall index exposure. The chart plots the beginning of month index average spread and simulated alpha for each month of the historical simulation. The broad relationship with spreads is well visible but the slope of that relationship can vary, and when corporate index spreads were close to or below 100bp, as in 2004 to 2007, the prospect for alpha was modest. The current opportunity set is starting to resemble the one available in 2004-2007: the Barclays US IG Corporate Bond Index is currently trading at a spread of 100bp, and systematic risk has become less dominant than in recent years, as indicated in the rightmost part of Figure 3.

FIGURE 17

Simulated active returns of a combination of strategies are related to market spreads in all periods



Source: Barclays Research

In a portfolio context, individual strategies compete for funding and hence risk allocation. Active strategies also interact with each other. For example, overweighting credit as a whole can help increase active risk allocation to sector and issuer strategies. On the other hand, if a sector strategy reduces allocation to a particular sector, it is difficult to exploit active name-specific views in that sector. Operating with long-only constraints or managing relative to a bond index creates implicit limits to risk exposures. Such limits typically encourage overweighting credit in general with a view to augmenting the active risk capacity of issuer selection and sector rotation strategies. This is more likely to occur in periods of low spreads, when implicit constraints arising from market or benchmark index structure become binding.

Identifying regimes

We have seen that time windows characterized by similar spreads do not always provide identical opportunity sets for active strategies. Issuer-selection skill is relatively more important when idiosyncratic risk is large relative to systematic risk while macro strategies are key in a regime characterized by high correlation and elevated systematic risk. Can we tell in advance which type of environment we are in? To address this question, we tried to explain issuer-specific risk using an index of economic policy uncertainty[12] in addition to spread levels. The intuition is that a high value of the uncertainty index corresponds to elevated systematic relative to idiosyncratic risk. We find that, in our sample, this index could help explain cross sectional volatility of issuer-specific returns. Figure 18 reports the volatility of issuer-specific return contributions (the residuals from equation 2) by period alongside average index spread and uncertainty index values. We note that while average spreads were similar in the first and last periods, the most recent period was characterised by greater systematic uncertainty and lower issuer-specific risk.

FIGURE 18

Issuer-specific volatility and Uncertainty Index averaged by period

	Issuer-specific return volatility (%)	Spread	Uncertainty Index
2000 to 2003	2.0	164	106
2004 to 2007	0.6	94	77
2007 to 2010	3.6	296	127
2010 to 2013	1.2	163	154

Source: Barclays Research

A simple linear regression indicates that the uncertainty index was able to help predict issuer specific volatility, but only to a very modest extent. We attempt to explain the cross-sectional volatility of issuer-specific returns with two regression models. The first uses just one factor; the average index spread at the beginning of the month; and the second uses two factors: the beginning-of-month spread and the uncertainty index six months prior to the observed month. Figure 18 reports regression results for the two models. The increase in R-squared from adding the uncertainty index is negligible prior to 2007, and this variable became significant only in the past seven years. While its usefulness within each sub-period is rather limited, it has greatest significance over the whole period, where it helps to identify the difference between similar-spread regimes with different volatilities, as discussed above.

[12] Baker, Bloom and Davis have developed an index of economic policy uncertainty (EPU) based on the frequency of newspaper references to policy uncertainty and other indicators. See Baker, S. R., Bloom, N. and Davis, S. J., "Measuring Economic Policy Uncertainty", 19 May 2013, www.PolicyUncertainty.com/media/BakerBloomDavis.pdf

FIGURE 19

Regression results by period: explaining issuer-specific volatility by spread and Uncertainty Index

	Spread only		Spread and Uncertainty Index	
	R-Squared	T-Stat of Spread Coefficient	R-Squared	T-Stat of U. Index Coefficient
2000 to 2003	60%	8.2	60%	-0.4
2004 to 2007	3%	1.1	4%	0.5
2007 to 2010	65%	7.1	70%	-2.2
2010 to 2013	40%	5.5	44%	-1.8
2000 to 2013	72%	20.8	78%	-6.2

Source: Barclays Research

Conclusion and portfolio management implications

Using a skill-based framework for analysis of investment strategies, we have explained how changing market conditions affect strategy performances as well as optimal allocations to different dimensions of active portfolio management.

We have shown that ideally, to achieve the most risk-efficient long-term performance, an active strategy should be designed to maintain a stable level of risk over time. Specifically, in our investigation of overall market positioning – the decision to be overweight or underweight credit as a whole – the best long-term information ratio was achieved by a policy of setting the magnitude of the active weight in either direction to a constant DTS contribution[13]. Even if active weights are expressed in market value terms, a similar effect can be achieved by periodically adjusting the magnitude of the active weights to be greater in low-spread environments and smaller when spreads are high.

We also found that simulated credit portfolio performance is heavily influenced by the prevailing level of spreads. This suggests that performance targets of active managers should be reviewed periodically and adjusted as a function of market spreads. The opportunity set for active management also changes as a function of the distribution of market risk between macro timing, sector allocation, and issuer selection. When the market is in a “risk-on, risk-off” mode, dominated by broad swings in overall risk aversion, the potential for generating alpha from sector rotation or security selection is reduced, as is the expected performance of the overall portfolio. An increase in correlation has an effect similar to a market-wide reduction in spreads: it limits the potential for implementing active risk and reduces the overall portfolio alpha. In this context, increasing the allocation to market timing in an attempt to compensate for reduced opportunities in other strategies could lead to a rapid reduction in the expected information ratio.

[13] This is based on the assumption that views are expressed only directionally, and that skill is constant. If we instead assume that views are expressed along a continuous scale, as in Grinold and Kahn do in the Fundamental Law of Active Management, it then becomes optimal to take larger positions when the view is stronger.

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