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Credit Versus Equities: Investing Across the Capital Structure

Executive Summary

- Companies issue both debt and equity to finance their operations, and their valuations should be linked to the enterprise value of the firm. However, due to investor segmentation, the capital market imposes little discipline in valuing the two (contingent) claims in a consistent manner.
- As a result, over the past 45 years, exposure to U.S. investment grade credit spreads had a Sharpe ratio that was roughly half of the Sharpe ratio of U.S. equities.
- Corporates have responded to this opportunity by increasing leverage. Yet there are natural limits to how far and how fast companies can respond, since excessive leverage lowers corporate flexibility. Reorganization costs are nontrivial, which limits leverage as well.
- All this is good news for investors willing to actively trade across the capital structure. At PIMCO we use the capital structure framework in two ways:
 - **Micro/Cross-Sectional value:** Over the last two decades, a long/short portfolio of bonds screened on the basis of cheapness relative to the equity market and based on this framework performed well. We also use this framework to identify attractive opportunities in sectors (like financials) where companies issue corporate bonds with various degrees of seniority.
 - **Macro/Beta timing:** Our framework models the aggregate corporate bond market as a single firm, and uses the balance sheet of the entire corporate sector to compare valuations across credit and equity markets. In contrast to equity beta, which is notoriously difficult to time, we find that the credit risk premium tends to be more predictable. We therefore believe this is a promising avenue for top-down beta timing in multi-asset portfolios.

Corporate debt and equities are closely related to each other, as they both represent claims on the assets of the issuing company. However, due to strong investor segmentation, valuation differences between the two converge only gradually.

This dynamic creates opportunities for investors with the flexibility to invest across the capital structure. In this article, we discuss the reasons for, and present empirical evidence supporting the existence of, such value opportunities. We also discuss

two closely related frameworks that might allow an investor to address the question, between corporate bonds and equities, which is the more attractively priced claim on U.S. public companies?

The most direct evidence of segmented markets is provided by the historical performance of credit relative to equities. The risk-adjusted returns of investment grade (IG) credit spreads over the past 45 years have been significantly worse than those of equities (Exhibit 1). The performance of both corporate credit and equities is procyclical; additionally, credit returns are more negatively skewed than those of equities. Given this negative convexity, investors should demand a higher Sharpe ratio from credit spreads (relative to equities). Historically, however, U.S. equities, as represented by the S&P 500, have delivered a Sharpe ratio of 0.36, while the Sharpe ratio of IG credit, as represented by the Bloomberg Barclays US Credit Index (after duration returns have been stripped out), has been 0.16 over the same period.¹ This underperformance of credit relative to equities is particularly pronounced at the long end of the credit curve.

Exhibit 1: Sharpe ratios of equities, credit and government bonds (Jan 1973-Mar 2019)

	U.S. equities ¹	U.S. IG credit ²	U.S. 10-year Treasuries ³
Full-sample (1973-2019) Sharpe ratio	0.36	0.16	0.26
Skewness	-0.4	-0.9	0.5
Sharpe ratios conditional on the business cycle:			
Recessions	-0.62	-0.26	0.70
Expansions	0.50	0.23	0.20

1. U.S. equities: Excess returns over the risk-free short-term rate are computed using the MSCI USA Index (1970–1987) and S&P 500 (1988–present).

2. U.S. credit: Excess returns are measured over duration-matched Treasuries (per year of duration at the beginning of each month). The history of U.S. credit excess returns begins in 1973. Source: Bloomberg and Barclays as of March 2019

3. U.S. Treasuries: Historical excess returns over the risk-free short-term rate to the Treasury series are estimated from par rates provided by Gürkaynak, Sack and Wright (full reference below), Federal Reserve H15 data and Ibbotson Associates. After 1988, the 10-year Treasury series is spliced with excess returns to the Bloomberg Barclays US Treasury 7-10 Year Index.

Source: Refet S. Gürkaynak, Brian P. Sack and Jonathan H. Wright, "The U.S. Treasury Yield Curve: 1961 to the Present," Finance and Economics Discussion Series 2006-28, Board of Governors of the Federal Reserve System, 2006

The dynamics of demand and supply in corporate credit versus equity markets support our conjecture of strong investor segmentation. We present some evidence of this in Section 1. In Section 2, we lay out an empirical methodology that is similar in spirit to the classical Merton capital structure model. The framework values credit relative to both equities and volatility-sensitive instruments like variance swaps. This has applications to the timing of relative exposures to equities versus credit.

In Section 3, we present evidence suggesting that credit spreads are more predictable than equity valuations. If this is indeed true, the gains from top-down, capital-structure-based timing signals come more from identifying dislocations in credit spreads than from equities. In conjunction with the relative value signal described in Section 2, this framework helps us in identifying regimes when credit significantly underperforms equities.

1. SUPPLY AND DEMAND OF CORPORATE CREDIT VERSUS EQUITIES

The evidence in Exhibit 1 relating to the underperformance of corporate credit relative to equities is indicative of segmented markets. In our view, this segmentation results from the delegated asset allocation employed by asset owners, who typically use a two-stage process (as discussed in Mattu et al. 2016).² They begin by creating a policy portfolio that allocates to equities, fixed income and, potentially, other asset classes. In the second step, asset owners pick "best in class" managers and assign asset-specific mandates to them. Typically, the fixed income allocation is benchmarked to popular fixed income indices, which are constructed by lumping corporate bonds together with government bonds. The equity allocation is similarly handed over to managers who specialize in stock selection. Neither set of managers has the flexibility to invest across the capital structure. The capital allocated to managers who invest across the capital structure based on relative valuations tends to be limited.

1 Due to several index construction rules, popular IG credit benchmarks understate the performance of the overall IG credit market. Additionally, one must consider the compositional difference between the overall credit and equity markets when comparing historical performance. Specifically: 1) IG credit indices remove issuers that are downgraded below an IG rating at the end of each month. The bonds of these issuers underperform due to forced selling by passive investors. 2) Bonds with less than one year to maturity are excluded from credit indices, and in the sample since 1973 short-dated corporate bonds have significantly outperformed the overall market. 3) Credit indices overweight financials and underweight technology relative to equity indices.

If we modified the credit index rules to own all bonds from the time they were included in the index until they matured, and reweighted each Global Industry Classification Standard (GICS) Level 1 sector to be equal to its weight in the S&P 500, the credit index would have a historical Sharpe ratio of 0.28 instead of the 0.16 Sharpe for the IG index.

2 See Ravi K. Mattu, Mukundan Devarajan, Steve Sapra and Dmitry Nikalaichyk, "Fixed Income Manager Selection: Beware of Biases" (PIMCO publication), April 2016.

The underperformance of corporate credit relative to equities over the past 45 years suggests that spreads were too tight relative to their equity beta and left-tail exposures. It follows that the cost of debt financing was low, indicating an opportunity for corporates to use debt markets to finance investments and buy back equity or for an astute investor to replace credit exposure with an equivalent risk allocation to equities.

From the supply side, there has been a measured response to this opportunity. Issuers have taken notice of the cheaper cost of corporate debt and have shown a preference for debt over equity financing. The face value of U.S. corporate debt grew

from \$1.2 trillion at the end of 2001 to \$5.1 trillion at year-end 2018 (for a compound annual growth rate of 8.2%). Over the same period, the market value of companies in the S&P 500 grew at a pace of 3.6% per year, while the book value increased at a rate of 5.3% per year (Exhibit 2).

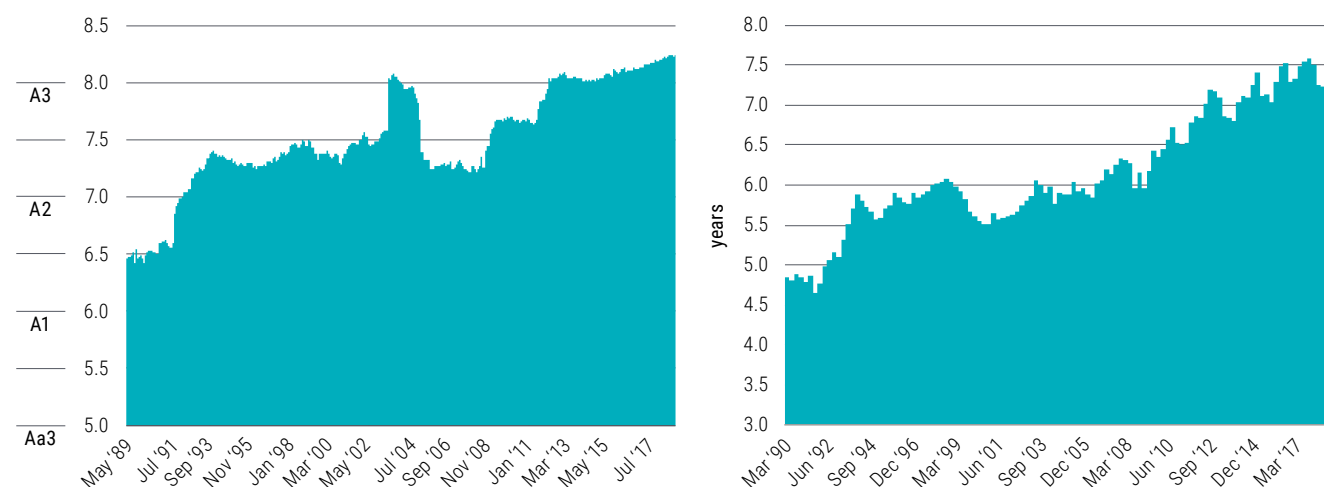
This preference for debt financing has resulted in a lowering of the average credit quality of the IG corporate market by roughly one notch (Exhibit 3), while expanding the number of companies that prefer a non-IG rating. Alongside this deterioration in credit quality, the average duration of the credit universe has extended by roughly two years.

Exhibit 2: Supply of U.S. equities versus investment grade corporate debt

	Market value of corporate debt (\$ trillion)	Market value of S&P 500 (\$ trillion)	Book value of S&P 500 (\$ trillion)	Corporate debt / (debt + book value of equities)
Dec. 2000	1.2	11.6	2.9	30%
Dec. 2010	2.8	11.7	5.4	35%
Dec. 2018	5.1	21.8	7.4	41%

Source: PIMCO and Bloomberg as of 31 May 2019

Exhibit 3: Average credit rating score and average duration of the Bloomberg Barclays US Investment Grade Index



Source: Bloomberg Barclays indices as of 30 June 2019

Despite the increased issuance, the ratio of net debt to enterprise value increased only modestly over the past decade (from 35% in 2010 to 41% in 2018, as we show in Exhibit 2). While it is possible that the recent reduction in corporate tax rates and lower tax shield of debt are likely to slow down the issuance of corporate debt, this supply-side response to investor segmentation is likely to continue, considering that credit spread valuations are tight.

A final point worth mentioning is that the growth in marketable U.S. corporate debt has not led to a commensurate increase in demand from every investor segment. In particular, we have seen a growth in corporate bonds held by overseas investors and households (largely through mutual funds). In our view, these trends have increased opportunities for active investing. Historically, the demand for corporate bonds has been dominated by institutional investors like insurance companies (as we show in Exhibit 4), which tend to be less opportunistic

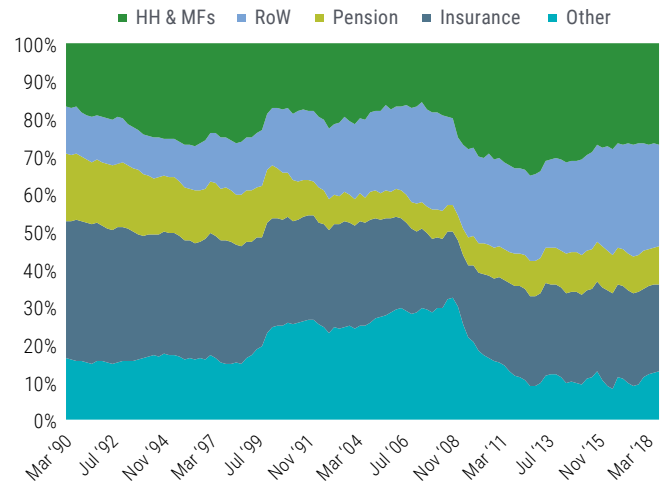
in responding to valuations. In contrast, households tend to sell risky assets during recessions, creating opportunities for value investors. This change in the ownership pattern of corporate bonds away from domestic institutional investors to

households and overseas investors could potentially result in higher vulnerability of corporate spreads in future economic downturns.

Exhibit 4: Ownership of U.S. corporate bonds

	Dec-18	Dec-01
Households and mutual funds	27%	17%
Pension funds	10%	12%
Insurance	23%	28%
Rest of the world	27%	17%
Other	13%	26%

Source: Z.1 Flow of Funds data, Board of Governors of the Federal Reserve System as of 30 June 2019



2. STRUCTURAL MODEL OF CORPORATE CAPITAL STRUCTURE: APPLICATION TO TOP-DOWN TIMING OF CREDIT VERSUS EQUITIES

Identifying value opportunities across credit and equities requires a unified model for valuing both debt and equity. The seminal work of Merton (1974) takes a simple insight linking corporate debt and equities as contingent claims on a company's assets and uses it to develop a structural valuation model for these securities.³ The economic position of risky corporate debt is equivalent to a bond issued by a hypothetical issuer that has no default risk with an overlay of a short put option on the company's assets. As such, we can model default as being triggered when the value of the company's assets falls below a threshold. The distance to this default threshold is a function of volatility and the company's leverage.

The Merton model is a good guide to the drivers of valuations of credit spreads, but in its simplest form it does not adequately incorporate several strategic options that equity owners and managers of the company can exercise. Investors

in corporate debt are in the unenviable position of "heads you win, tails I lose." If the company does well, it will likely increase leverage to get back to the optimal capital structure. Conversely, if the company does poorly, it can issue new debt that is senior to existing debt. Capital structure choice provides a valuable option to equity holders. Although this has typically been true for IG companies, the evolution of the high yield (HY) market toward lighter covenant restrictions has resulted in greater flexibility for more-leveraged companies as well. Because modeling these various options for every company is complex, real-world applications inevitably rely on reduced form representations.

The structural approach can be applied at the level of the corporate credit market as a whole, viewing the aggregate corporate balance sheet as a representative company. The relationship implied by this framework can be estimated empirically using a simple model in which the "fair" value of the spread of the corporate credit index is related to the realized volatility of equity index returns and leverage measured by an aggregation of corporate balance sheets.⁴

³ Robert C. Merton, "On the Pricing of Corporate Debt: The Risk Structure of Interest Rates," *Journal of Finance*, May 1974: 449-470

⁴ We incorporate leverage characteristics of the relevant universe of corporate bonds because these characteristics are likely to vary materially by rating bucket. The equity volatility is that of the S&P 500 index.

More specifically, we fit a model of the form:

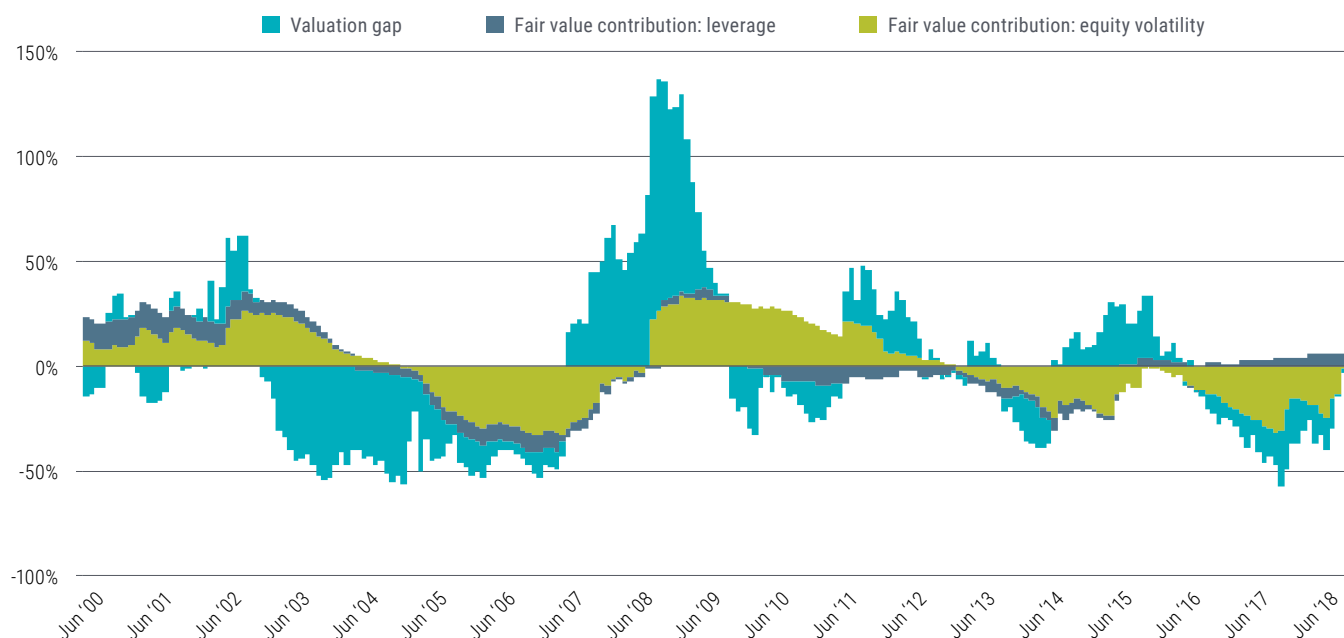
$$\ln(\text{Spread}) = \alpha + \underbrace{\beta_{lev} \cdot \text{Leverage}}_{\text{Fair deviation from long-run average}} + \underbrace{\beta_{vol} \cdot \text{EquityVol}}_{\text{Valuation gap}} + \varepsilon \quad (1)$$

In Exhibit 5, we show the result of this empirical exercise for U.S. BBB spreads, breaking down the deviation of spreads from their long-run averages into that due to equity volatility and leverage and the residual – which is defined as a valuation gap.

Typically, leverage and equity volatility explain approximately 40% of the variation in IG spreads over time (compared with roughly 50% for HY). More important for active investors, deviations from fair value (i.e., the “valuation gap”) typically tend to reverse over a period of time; this makes such frameworks useful in developing valuation anchors and estimates of expected excess returns.

While this approach to corporate spread valuations is a useful guide for timing credit spread exposures on a stand-alone basis, it does not explicitly include relative valuations across credit and equities. Another approach useful in determining relative valuations across the corporate capital structure is to use the empirical relationship between the excess returns of equities versus those of credit. Exhibit 6 presents the unconditional (full-sample) beta of IG and HY excess returns (over Treasuries) to the equity market.

Exhibit 5: Percent deviation of U.S. BBB credit spreads versus average: fair value versus valuation gap



Source: PIMCO and Bloomberg. U.S. BBB credit spreads are proxied by the OAS of the Bloomberg Barclays US BBB Corporate Index. Fair value is based on the model described above.

Exhibit 6: Sensitivity (beta) of credit excess returns to equity returns (Jan 1995–Apr 2019)

	IG corporate excess returns over Treasuries		HY corporate excess returns over Treasuries	
	Contemporaneous	Current and previous month	Contemporaneous	Current and previous month
Beta to S&P 500	0.21	0.29	0.37	0.53
Correlation with S&P 500	54%	58%	59%	65%

Source: PIMCO and Bloomberg

The betas presented in Exhibit 6 are a useful first approximation for the short-term co-movement between equity and credit returns, but they miss some of the nuance in the relationship between equities and credit. As we saw before, while equities represent a positively convex claim on a company's underlying assets, the payoff to corporate credit is negatively convex. We should expect this to lead to a higher sensitivity of credit to equity on the downside than on the upside.

Exhibit 7 estimates this relationship by separating the history into months where the S&P 500 had positive and negative excess returns over cash (as proxied by one-month overnight index swap rates). The beta of IG corporate credit to equities when estimated unconditionally was 0.21 – however, this drops to 0.12 on the upside and rises to 0.3 on the downside. Similarly,

the 0.37 beta of HY (as proxied by the excess returns of the Bloomberg Barclays US HY Index) to equities falls to 0.2 on the upside and increases to 0.52 on the downside.

Interestingly, after adjusting for the level of spreads (risk), the difference between betas in down markets versus up markets for equities is roughly the same for IG and HY corporate bonds. Arguably, however, macroeconomic conditions ought to affect IG-rated corporates more materially. Default and downgrade rates for IG rise significantly in recessions relative to expansions, while for HY these effects are less pronounced (see sidebar on pg. 7). As a result, we would have expected larger negative convexity associated with the IG index. The empirical result in Exhibit 7 could reflect the limited length of the historical sample period. Additionally, the average duration of HY indices is shorter than that of IG indices, which could lead to incremental negative convexity.

Exhibit 7: Equity beta of credit excess returns in up versus down markets (Jan 1995–Apr 2019)

(Only using concurrent month returns)	IG corporate excess returns over Treasuries	HY corporate excess returns over Treasuries
Conditional beta estimated in months when S&P 500 returns were ...		
... positive ("up" beta)	0.12	0.20
... negative ("down" beta)	0.30	0.52
Unconditional contemporaneous beta	0.21	0.37
Down beta – up beta	0.18	0.32
Down beta – up beta, scaled to IG spread and duration	0.18	0.22

Source: PIMCO and Bloomberg. HY is proxied by the excess returns of the Bloomberg Barclays US HY Index. IG is proxied by the Bloomberg Barclays US Credit Index.

CYCLICAL PROPERTIES OF DEFAULT AND DOWNGRADE RATES IN IG VERSUS HY

Corporate fundamentals deteriorate in periods of economic weakness. Default and downgrade rates increase, along with an increase in credit spreads. Exhibit 8 below presents evidence of this for IG and HY issuers since 1970.

Exhibit 8: One-year-ahead issuer-weighted average default and downgrade rates; 1970-2018

	One-year-ahead default rate		One-year-ahead downgrade rate: downgrade/(downgrade + upgrade)	
	IG	HY	IG	HY
Full-sample average	0.1%	3.7%	60%	47%
Averages conditional on:				
Recessions	0.17%	5.7%	70%	50%
Expansions	0.05%	3.3%	59%	44%
Ratio of average in recessions/ expansions	3.31	1.72	1.20	1.07

Source: Moody's Default & Recovery Database as of 31 March 2019. IG and HY are consistent with Moody's definitions.

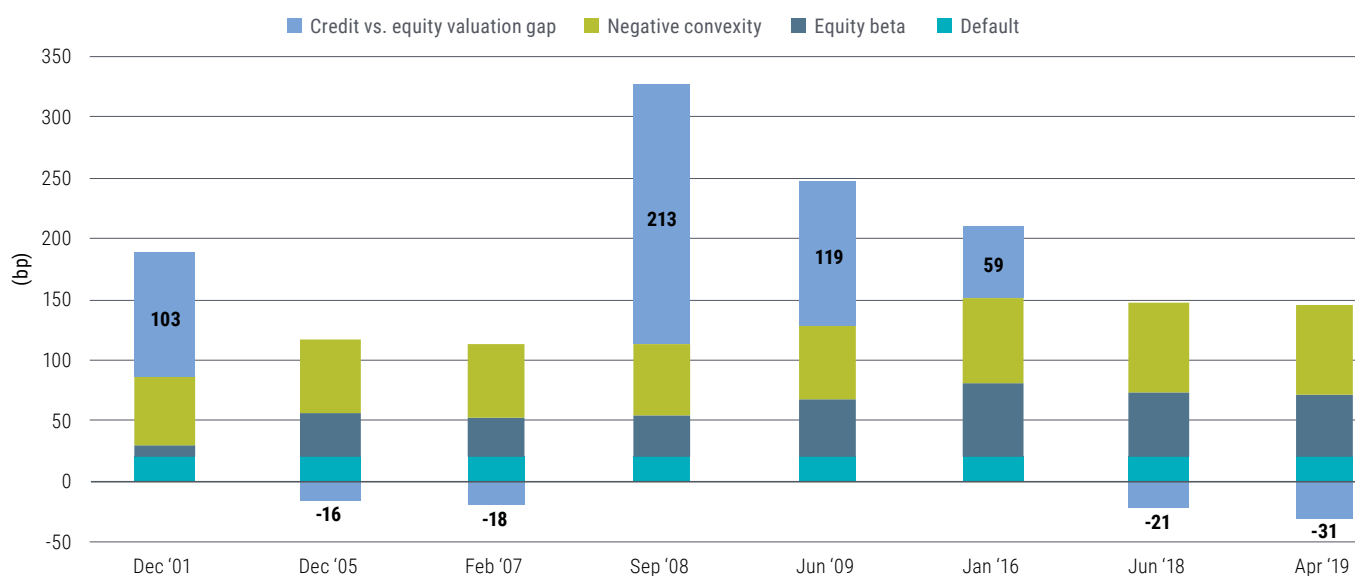
For IG issuers, one-year-ahead default rates tend to be, on average, close to 0.05% in expansions. In recessions, this rate rises to 0.17%, representing a threefold-plus increase versus the average in expansions. For the HY market, the increase is not as dramatic: Default rates for non-IG companies during recessions increase to less than twofold their average during expansions.

Expected excess returns on corporate credit (i.e., the fair value of spreads) ought to be related to this positive and asymmetric exposure to equities. Therefore, we can consider the risk premium in credit (i.e., spreads in excess of those needed to actuarially make up for expected losses due to default) to be compensation for 1) the unconditional beta of credit to equities and 2) incremental beta on the downside – its negative convexity.

In Exhibit 9, we break down the option-adjusted spread (OAS) of U.S. nonfinancial⁵ IG bonds into expected default losses and fair compensation for equity beta and negative convexity. The residual between observed net (of losses) spreads and

the compensation for equity beta and convexity can be interpreted as either the compensation for relative illiquidity or a valuation gap. To estimate the fair compensation for equity beta and negative convexity, we estimate empirical betas of excess returns of corporate credit over duration-matched Treasuries with respect to the returns of both the equity market (over cash, as proxied by one-month overnight index swap rates) and variance swaps on the S&P 500 index. We use these historical betas along with ex ante estimates of equity risk premium and convexity risk premium to estimate the fair compensation for these exposures embedded in corporate spreads.

⁵ We focus on nonfinancial corporate bonds because they readily lend themselves to being modeled in the structural framework. Financials require special treatment of the layers of their capital structure, which vary in their risk characteristics and embedded optionality. In the sidebar below, we outline PIMCO's approach to modeling the capital structure of financials.

Exhibit 9: Credit versus equities relative value metric (2001-2019)

Source: PIMCO AND Bloomberg as of 31 May 2019

A positive (negative) valuation gap in Exhibit 9 suggests credit is cheap (rich) versus equities. This relative valuation metric abstracts away from both the compositional differences between debt and equity markets and the subtler distinction in the choice of the replicating option: Bond indices are short a portfolio of options, while the replicating portfolio is short an option on the S&P 500. Interestingly, estimates of negative valuation gaps preceding the 2008–2009 financial crisis were modest relative to the positive gaps seen during and since the crisis. This could, in part, reflect the secular decline in equity risk premia.

Despite its limitations, this methodology has been a reasonable guide for subsequent performance. Estimates of this residual increased ahead of periods of macroeconomic stress and remained low during times of benign conditions. Furthermore, this residual exhibits mean reversion and has potential as a guide for top-down views on positioning across the corporate capital structure. The capital structure model has applications in single-name credit selection as well. In the sidebar below, we outline PIMCO's approach to applying this model in the context of identifying micro/cross-sectional relative value.

PIMCO'S APPROACH TO APPLYING THE CORPORATE CAPITAL STRUCTURE MODEL IN CREDIT SELECTION

We discussed how to use the Merton framework to make choices across the capital structure. This framework can also be used in choosing among otherwise comparable credits. At PIMCO, we have adapted the structural approach to bottom-up credit selection in two distinct ways – one for highly levered firms like financials and another, simpler approach for nonfinancial companies.

In the case of modeling financial firms, we calibrate the Merton model to equity and senior unsecured debt to calculate market implied volatility for a bank's assets. For pricing, we then overlay these asset dynamics on the complex capital structure of a financial institution. This ranges, in declining order of seniority, from insured

deposits to senior secured debt (like covered bonds), operating company unsecured debt, holding company debt and subordinated debt to hybrid securities like contingent convertible preferred bonds (CoCos), preferred equity and, finally, common equity.

For nonfinancial companies, we have taken a simpler approach to applying the structural model. We begin with an estimate of distance to default (DD), defined as:

$$DD \equiv \left[1 - \frac{\text{Total Debt}}{\text{Enterprise Value} + \text{Cash}} \right] \times \frac{1}{\text{Equity volatility}} \quad (2)$$

To calculate a fair spread, we posit a cross-sectional relationship between the firm's spreads and DD:

$$\ln(\text{Spread}) = \alpha + \beta_{DD} DD + \beta_{DD^2} DD^2 + \beta_{MVE} \ln(\text{Equity MarketCap}) + \varepsilon \quad (3)$$

We then measure the cheapness or richness of bonds in relation to this fair spread metric as a relative value signal.

Valuations are assessed based on the relationship between the DD metric and spreads. This is a reduced form empirical methodology, as opposed to a full-blown dynamic model that prices equities and credit while also identifying a default barrier and risk premium. However, this simplified approach brings in most of the relevant features of such a model. As a complement to fundamental credit research, it can be helpful in decisions to over- or underweight individual credits.

In Exhibit 10, we present the historical excess returns of IG issuers sorted into quintiles based on their richness relative to their DD score. While this analysis does not incorporate transaction costs and is likely to overstate the realizable alpha, it demonstrates the use of a Merton-style structural approach to identify relative value within credit.

This setup implicitly assumes that equities are informationally more efficient than corporate bonds. Indeed, we find the framework works better for large cap issuers and those with relatively low leverage. Interestingly, the relative performance of cheap versus rich portfolios is robust to controlling for liquidity costs, indicating that in corporate credit this value factor is related to more than just liquidity.

Exhibit 10: Excess returns (before transaction costs) of U.S. nonfinancial IG issuers in excess of the market, by quintile of richness (1997-2018); quarterly rebalancing

Excess returns versus credit market	Q1 (rich)	Q2	Q3	Q4	Q5 (cheap)	Q5-Q1	Q4-Q2
Mean (% p.a.)	-2.1	-0.6	0.0	0.4	1.2	3.3	1.1
Std. deviation (% p.a.)	1.4	1.0	0.6	0.6	1.3	2.4	1.5
Information ratio	-1.58	-0.67	-0.06	0.74	0.93	1.37	0.75

Source: PIMCO and Merrill Lynch indices as of 31 May 2019

3. CREDIT VERSUS EQUITY VALUATIONS OVER THE BUSINESS CYCLE

As discussed earlier, equities and credit spreads (over Treasuries) are both procyclical. However, nuances related to this pro-cyclicality provide opportunities for top-down asset allocation across the capital structure. In Exhibit 11, we present the Sharpe ratios of U.S. equities and IG credit (over Treasuries) for the calendar halves of economic expansions since 1973. Though equities tend to outperform throughout expansions, they do less well in the late stages. On the other hand, credit spreads' outperformance in expansions is almost entirely restricted to the early stages. Credit spreads appear to lead equities in underperforming ahead of recessions.

Exhibit 11: Sharpe ratios of equities, credit and Treasuries in early and late expansions (Jan 1973-Mar 2019)

	U.S. equities	U.S. IG credit
Recessions	-0.62	-0.26
Expansions	0.50	0.23
First-half expansions	0.65	0.41
Second-half expansions	0.28	-0.06

Source: Refet S. Gürkaynak, Brian P. Sack and Jonathan H. Wright, "The U.S. Treasury Yield Curve: 1961 to the Present," Finance and Economics Discussion Series 2006-28, Board of Governors of the Federal Reserve System, 2006. U.S. equities are proxied by the S&P 500 index and U.S. IG Credit is represented by the Bloomberg Barclays IG Credit Index. Recessions and expansions are as defined by NBER. We divide expansions into two equal calendar halves and present Sharpe ratios and equity correlations for these subperiods as well.

Exhibit 12: U.S. nonfinancial corporate fundamentals (Mar 1955-Dec 2015)

1955-2015	EBITDA growth (q-o-q, % p.a.)	Dividend yield (%)	Equity market cap/ EBITDA	Net debt growth (q-o-q, % p.a.)	Change in leverage (q-o-q, % p.a.)
Recessions	-4.4	3.6	4.2	6.6	2.4
Expansions	8.4	3.1	4.9	7.9	0.6
First-half expansions	10.2	3.1	4.8	6.3	-0.7
Second-half expansions	6.0	2.9	5.0	10.0	2.2

The first and second halves of expansions correspond to the calendar halves of NBER expansions.

Source: Federal Reserve System Financial Accounts of the United States and NBER. U.S. nonfinancial corporate bonds are as classified by the Z.1 Flow of Funds accounts.

The divergence of performance between equities and credit in the late stages of expansions can potentially be linked to the behavior of corporate managements in that part of the business cycle. In Exhibit 12, we present some evidence from the past 60 years relating to U.S. nonfinancial corporations.

In the late stages of economic expansions, corporate profit growth tends to slow, but payout to shareholders is relatively stable (in the form of increased dividends or share buybacks) and equity valuations (price/EBITDA multiples) remain buoyant. Payouts to shareholders are often financed by an

expansion of net debt and leverage, which results in deterioration in credit quality and wider credit spreads in the late stages of expansions.

Do equities and credit provide similar opportunities for timing?

Top-down asset allocation decisions across the capital structure rely on mean reversion in valuation metrics. To determine if such opportunities are equally attractive in credit and equities, we examine the dynamics of valuations in credit and equities, and their relationship with valuations and the business cycle, as shown below:

$$\Delta \ln m(t+1) = a_1[m_\infty - \ln m(t)] + b_1[\theta(t+1) - \bar{\theta}] + c_1 \Delta r(t+1) + \varepsilon_1(t+1) \quad (4)$$

$$\Delta \ln s(t+1) = a_2[s_\infty - \ln s(t)] + b_2[\theta(t+1) - \bar{\theta}] + c_2 \Delta r(t+1) + \varepsilon_2(t+1) \quad (5)$$

where $m(t)$ is the price-dividend multiple of the equity market at the end of year t and $s(t)$ is the credit index OAS at the end of year t . The parameters m_∞ and s_∞ are the long-term averages of these valuation metrics, representing the level to which

valuations would be expected to revert over the long term. Also, a_1 and a_2 are the speeds at which valuations revert to these long-run averages.

Exhibit 13: Effect of mean reversion and business-cycle shocks on valuations (1986-2018)

	Mean-reversion effects	Valuation effects	Business-cycle effects	
	Long-run average	Reversion speed (% per year)	Effect of recession	Monetary policy effect
U.S. equities	P/D: 50.3	18%	-31%	-2% *
U.S. IG credit spreads	OAS: 112 bps	52%	50%	-5% *

* Estimates of the coefficient related to monetary policy are not statistically significant.

Hypothetical example for illustrative purposes only.

Source: PIMCO and Bloomberg

Effects related to the business cycle are represented by two variables: $\theta(t+1)$ is the proportion of the year $t+1$ that the U.S. economy spends in recession, $\bar{\theta}$ is the long-term mean of $\theta(t)$, and $r(t)$ is the short-term interest rate at the end of year t (to capture the effect of monetary policy). We present the results of the above regressions in Exhibit 13.

The results we present in Exhibit 13 suggest that the effect of the business cycle is economically and statistically significant. More important, mean reversion historically has been stronger for credit spreads than for the price-dividend multiple in equities. This is partly attributable to the rerating of equity valuations that we have witnessed over the past three decades. This leads us to conclude that the gains from top-down, capital-structure-based timing signals come from identifying dislocations in credit spread rather than in equity valuation.

4. CONCLUSION

Over the past couple of decades, supply-side trends have acted to offset the impact of investor segmentation across corporate credit and equity markets. However, the pace of this change has been somewhat slow, leaving opportunities for investors who have the flexibility to actively allocate exposures across the corporate capital structure.

PIMCO employs a framework that adapts the classical Merton-style structural framework to identifying top-down relative value opportunities across credit and equities, as well as in credit selection. Our approach makes use of nuances related to the time variation in credit and risk premia over the business cycle and has historically been a valuable guide for positioning optimally across corporate equities versus credit.

This paper contains **hypothetical analysis**. Hypothetical and simulated examples have many inherent limitations and are generally prepared with the benefit of hindsight. There are frequently sharp differences between simulated results and the actual results. There are numerous factors related to the markets in general or the implementation of any specific investment strategy, which cannot be fully accounted for in the preparation of simulated results and all of which can adversely affect actual results. No guarantee is being made that the stated results will be achieved.

Stress testing involves asset or portfolio modeling techniques that attempt to simulate possible performance outcomes using historical data and/or hypothetical performance modeling events. These methodologies can include among other things, use of historical data modeling, various factor or market change assumptions, different valuation models and subjective judgments.

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