Documenting a Correlation Between High-Yield Spreads and Forward Investment Returns

Christopher C. Smith

2022-06-22

Introduction

High-yield spreads, the difference in yield between investment-grade and high-yield bonds, can be interpreted as a measure of credit market stress. In a good economy, default rates are relatively low, and high-yield bonds pay average yields fairly close to their average coupon rates. But in a bad economy, default rates rise—especially for high-yield bonds—and average yields fall somewhat below average coupon rates. Investment grade bonds, in contrast, have less default risk and remain relatively unaffected by economic downturns. Thus, when investors see a bad economy ahead, they discount high-yield bonds relative to investment grade bonds, demanding a higher yield in exchange for more credit risk.

Notably, high-yield spreads tend to peak around the same time that US stock markets bottom. Might high-yield spread data then contain a tradeable signal for stocks? There's reason to think it might. Whereas stock markets tend to go up over time, high-yield spreads tend to move in a more predictable (and thus easier-to-interpret) range. Conventional stock market wisdom also holds that the bond market is "smarter" than the stock market, so perhaps informational signals from bonds will front-run moves in stocks. In this short paper, my goal is simply to demonstrate and document the correlation between high-yield spreads and forward investment returns for stocks, as well as for investment-grade and high-yield bonds.

Analyzing S&P 500 Forward Returns

We begin by looking at correlation coefficients between high-yield spreads and forward returns over various timeframes.

pearsons_6mo	pearsons_1yr	pearsons_2yr	pearsons_3yr
0.3798507	0.5258197	0.5256414	0.1503448

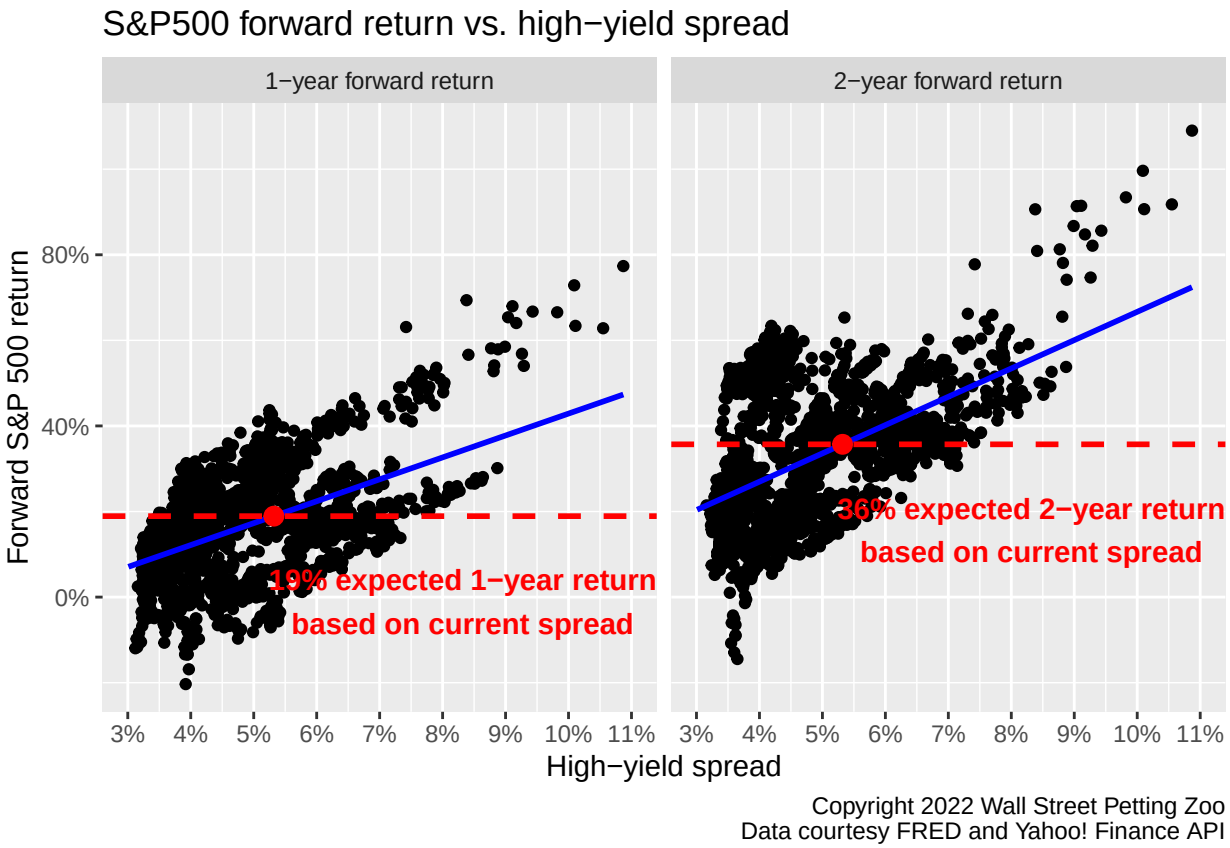
Examining this data, it appears that high-yield spreads have predictive power for returns over a one-year and two-year timeframe, but that correlations are weaker on shorter and longer timeframes. Thus, we will focus on the one-year and two-year timeframes.

Next, we will plot high-yield spreads against next-one-year and next-two-year returns, with a regression model to show expected return. To choose between linear and log regression models, we perform a ten-fold cross-validation and choose the model that minimizes residual mean-squared error, on average, across both timeframes. In this case, that's the linear regression model:

Model	Mean_RMSE
Linear	0.1146206

Model	Mean_RMSE
Log	0.2030653

When we create the plot, we see a nice, clear relationship between the two variables—with higher forward S&P 500 returns when high-yield spreads are high—across both timeframes. The relationship is just as strong on the two-year timeframe as on the one-year timeframe. The current yield spread is shown on the chart as a red dot, with the current expected return shown as a dashed line. Now appears to be a good time to buy the S&P 500, with expected forward two-year return at 36%.



Analyzing High-Yield Bond Forward Returns

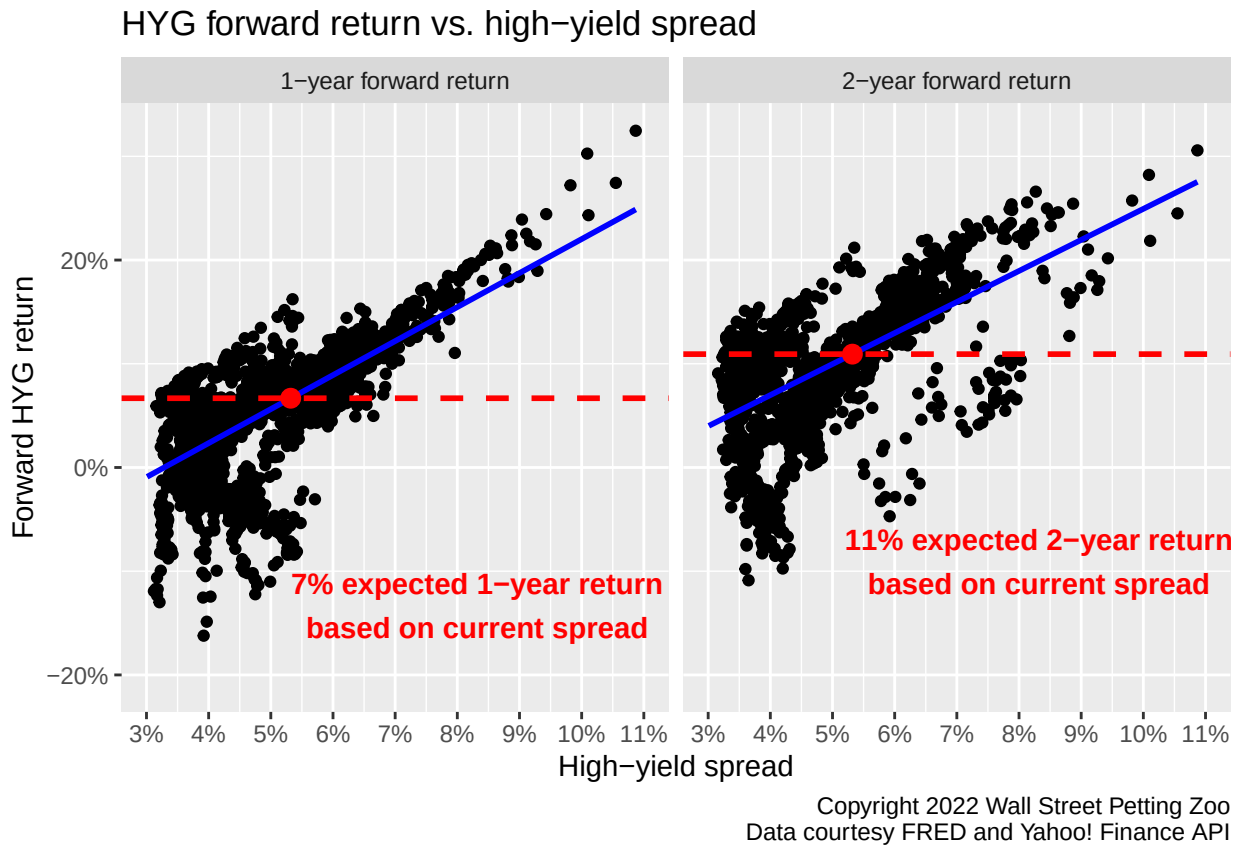
Since high-yield spreads are literally a measure of excess yield on high-yield bonds, we might expect a strong, positive relationship with forward return on a high-yield bond ETF. Looking at the correlation coefficients, that's indeed what we find. The coefficients are positive and similar to the coefficients for the S&P 500.

pearsons_6mo	pearsons_1yr	pearsons_2yr	pearsons_3yr
0.591429	0.6810424	0.6040599	0.398588

We again perform a ten-fold cross-validation to determine the best regression model. As with the S&P 500, a linear model minimizes residual mean-squared error better than a log model.

Model	Mean_RMSE
Linear	0.0450588
Log	0.0763361

Plotting actual and modeled returns, we again observe a highly positive and highly significant relationship between high-yield spreads and forward returns. Expected forward returns are lower than for the S&P 500, with current expected one-year return at 7%, and expected two-year return at 11%.



Analyzing Investment-Grade Bonds Forward Returns

What about investment-grade bonds? Investment-grade bond yields tend to be higher, on average, when high-yield spreads are higher, so we might expect a positive relationship with forward returns here, as well. In fact, many financial advisors will recommend investment-grade bonds as a "safe-haven" in a bad credit environment, when high-yield spreads are high. But in fact, we find the opposite. The relationship between high-yield spreads and forward returns for US Treasury bonds is robustly negative:

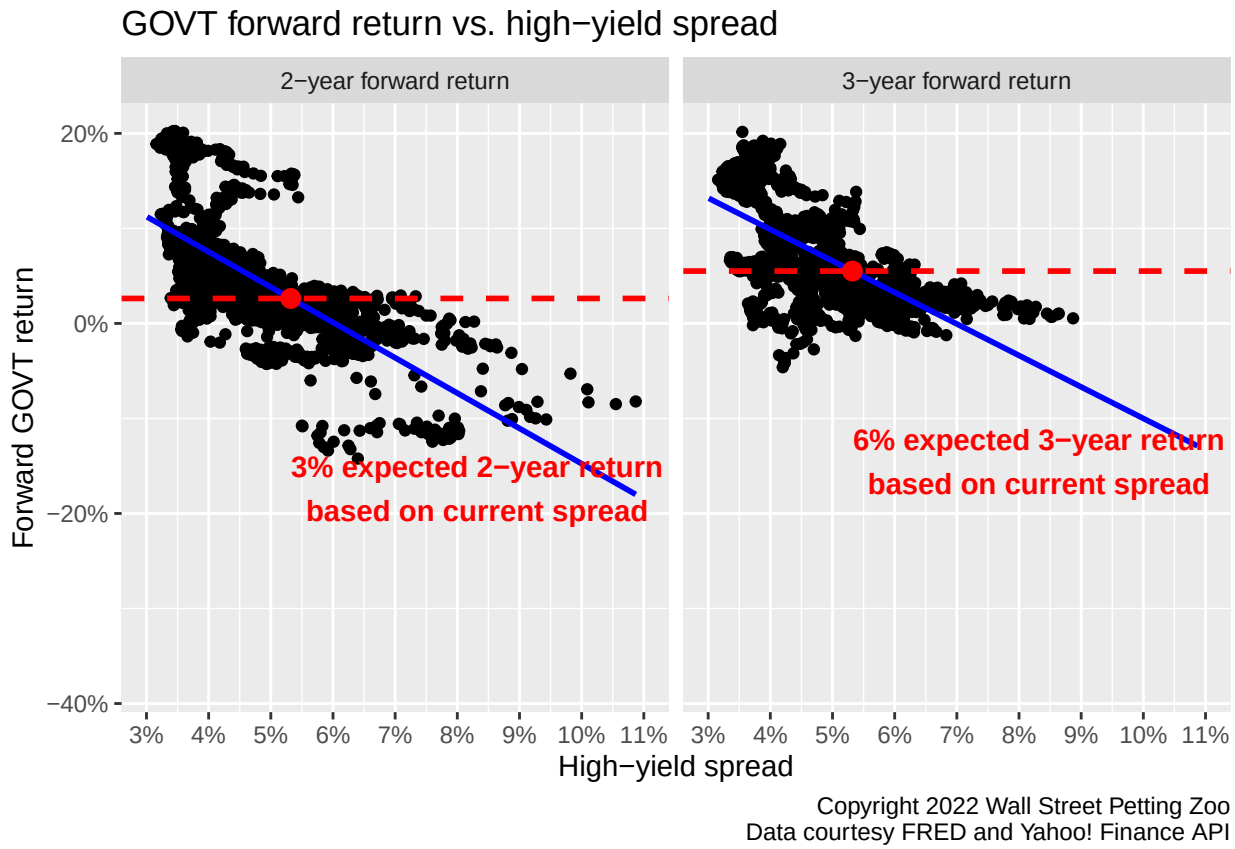
pearsons_6mo	pearsons_1yr	pearsons_2yr	pearsons_3yr
-0.0360817	-0.3514326	-0.7023262	-0.64463

This suggests that when high-yield spreads are high, the "flight to safety" tends to be overdone and treasury bonds overpriced.

Here, it is the two-year and three-year timeframes that are most significant, so those are the timeframes we will focus on. (Perhaps investment-grade bonds respond to informational signals more slowly than higher-risk, more actively traded assets.) Performing our ten-fold cross validation, we again confirm that it is the linear model that minimizes residual mean-squared error.

Model	Mean_RMSE
Linear	0.0440421
Log	0.0642369

Finally, we plot our data. Current expected one-year return on the GOVT ETF (a medium-duration portfolio of US Treasury bonds) is merely 1%, making this probably *not* a good time to buy Treasury bonds. And expected returns will only get worse as high-yield spreads rise.



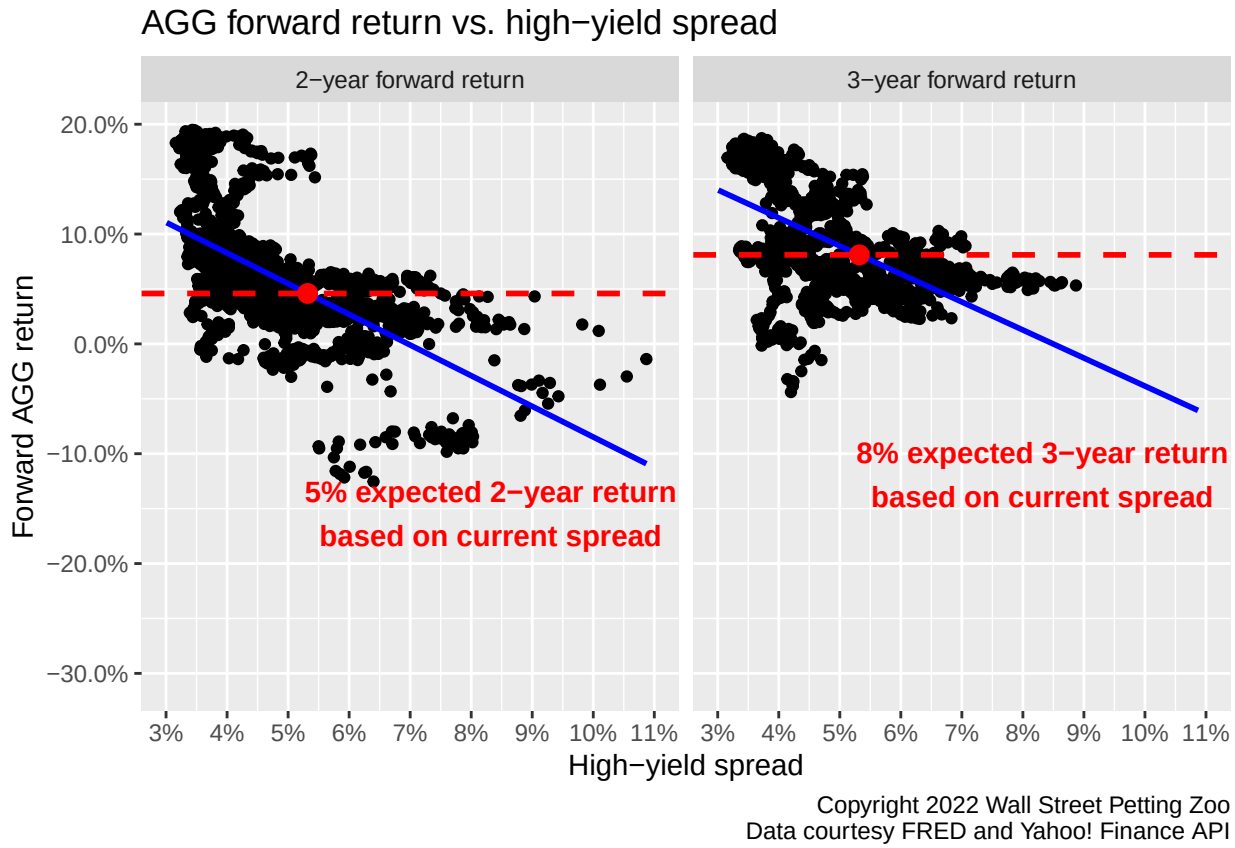
For investment-grade corporate bonds exhibit a similar dynamic. As with Treasury bonds, we find a negative relationship with forward returns, with the most significant signal on the two-year and three-year timeframes.

pearsons_6mo	pearsons_1yr	pearsons_2yr	pearsons_3yr
0.1512275	-0.1739624	-0.6257373	-0.570011

Ten-fold cross-validation again confirms that a linear model best minimizes residual mean-squared error.

Model	Mean_RMSE
Linear	0.0415689
Log	0.0608447

Plotting our data, we again find a negative relationship with forward returns, although expected returns are higher than for Treasury bonds.



Conclusion and Directions for Future Research

In conclusion, it makes good sense to rotate out of investment-grade bonds and into higher-risk assets such as stocks and high-yield bonds as high-yield spreads rise. And perhaps also the converse: as high-yield spreads fall, the risk involved in stocks and high-yield bonds may cease to be worth taking relative to the risk of investment-grade bonds. Rotation in and out of different asset classes could be scaled, staged, or triggered when a certain threshold is reached. We might, for instance, use the high-yield spread's percentile as a heuristic for asset allocation. As an example, the current high-yield spread is in the th percentile of our historical data. Thus, we might go stocks or high-yield bonds, and investment-grade bonds. We could rebalance in accordance with changes in the high-yield spread's percentile rank.

In a future extension of this study, I will look at spreads between investment-grade and high-yield bonds in emerging markets, as well as between US and emerging markets bonds. I will experiment with incorporating information about the base discount rate, perhaps transforming yield spread as a percentage of discount rate, or perhaps rendering the base rate as a color gradient on the chart. I will see if the slope of a moving average of high-yield spreads (i.e. is the spread rising or falling?) affects forward returns. I will map date onto my charts as a color gradient and see if there are time effects I need to control for. I will use machine

learning techniques to determine how effective our models might be for forecasting out-of-sample. I will also incorporate information about the variance in the data to calculate Sharpe ratios for comparison across asset classes. And finally, I will propose a specific portfolio rebalancing strategy pegged to the high-yield spread.