Finance in Montana
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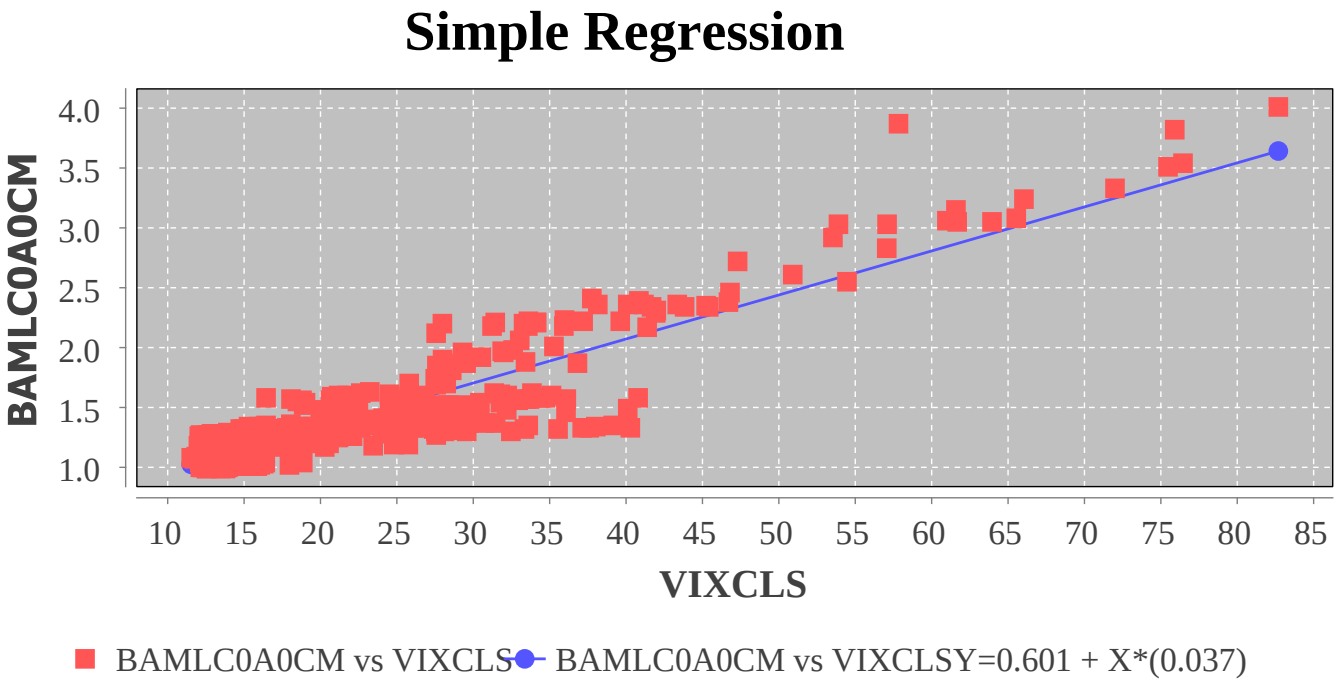
"Bond traders are smarter than equity traders". We hear this quote often. In this blog, we illustrate the positively correlated relationship between the CBOE VIX index and corporate bond spreads. Of course, finance professionals understand this relationship, but with split regressions we identify regime shifts in the trading of corporate bonds.

The Data

We use the ICE BofA US Corporate Index Option-Adjusted Spread and the CBOE Volatility Index: VIX data series available from the St. Louis Federal Reserve. We use the last 500 trading days just as we did in the previous post. The scatter plot of data point is shown below.



The scatter plot is shows the rise in option adjusted corporate bond spreads relative to an increase in the CBOE VIX contract. The equation regression equation is

BAMLC0A0CM = 0.601+0.037*VIXCLS R2:0.825

I never liked this graph as the datapoints are clustered at points where the VIX is less than 30 and widely dispersed at volatility levels exceeding 30 percent. The data points are thus heteroscedastic with the classical shotgun scatter pattern. With split regressions we can do better. Much better and we rid ourselves of the heteroscedasticity problem.

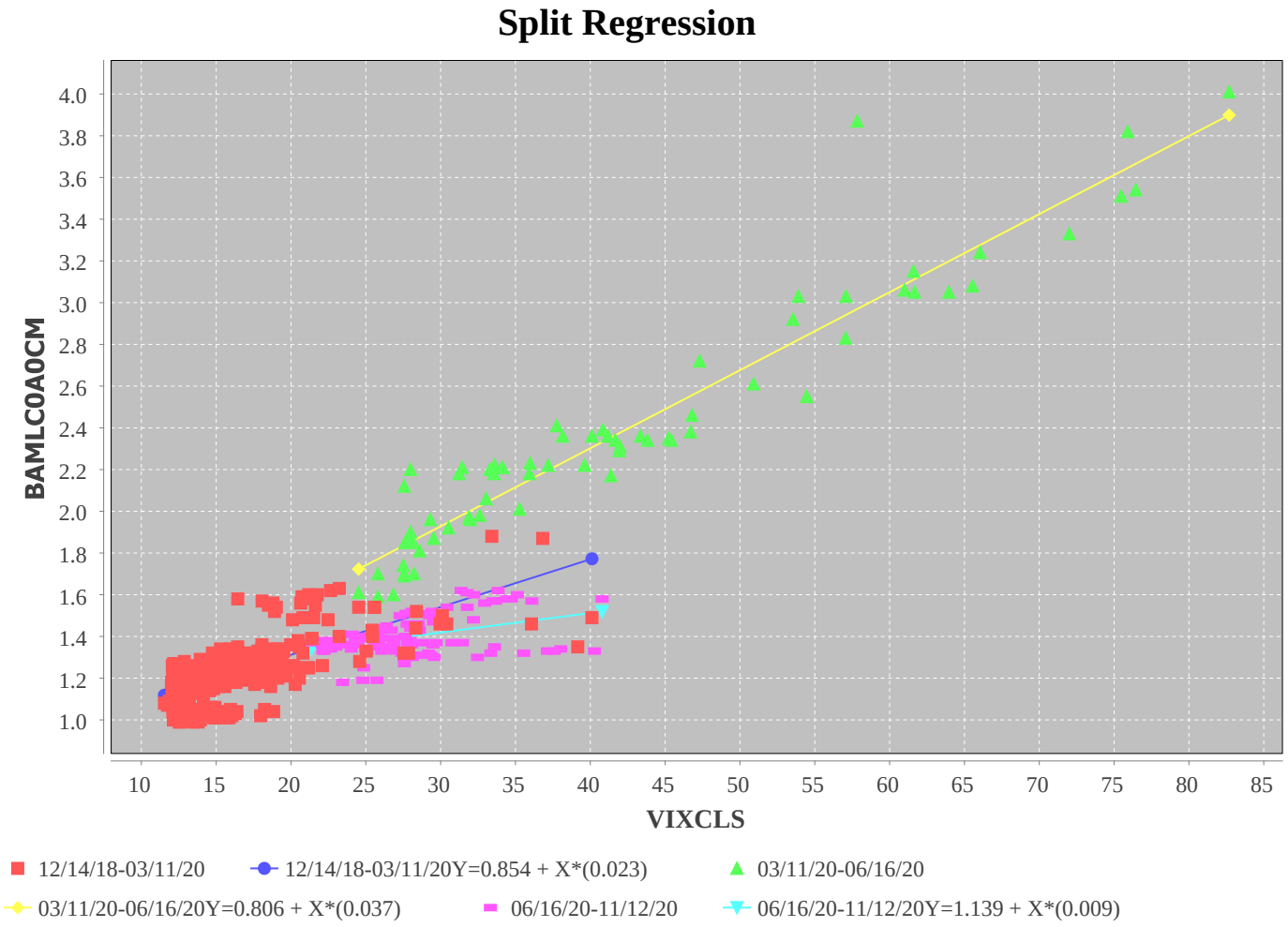
Just as in the post on VIX and the S&P 500. I'll employ 'split regression' to tell our tale. That tale might elucidate the staid thinking of bond traders. Equity trading is a spectacle of equity investors trading the call value of the asset side of a balance sheet against debt liabilities. In bankruptcy,

debt owners assume the assets of the firm. Equity holder receive nothing in return. Debt is thus a short put option to our coupon clippers.

To run the split regression I look at all possible combinations of three regression lines with at least 30 data points in each regression. The algorithm outputs:

Combinations tried:84255
Regression Count:252432

In just about 10 seconds, we see our new graph with three different regimes that minimize the combined total sum of squared errors:



We identify three distinct regimes. Those lines likely correspond to the 'risk on/risk off' language we so often hear in financial media outlets. Below is a table of the three regression statistics for the three regression lines:

Split	Observations	Period	Constant	Beta	R-Square
1	322	12/14/18-03/11/20	0.854	0.023	0.473
2	69	03/11/20-06/16/20	0.806	0.037	0.913
3	108	06/16/20-11/12/20	1.139	0.009	0.179

The combined R-Square is an astonishing 0.994. More interesting is the second regression with the period March 16 2020 to June 15, 2020. The constant would be the base line credit spread.

The beta or 3.7 basis points for every one point increase in volatility. Note in the previous post, the jump in the regime change was on Jan. 24, 2020. Equity traders, as owners of calls, seem to be more attune to changes in market news. Only until two months later do our coupon clipper adjust their risk profile. On that date the Federal Reserve dramatically slashed rates to support failing asset prices. Also on that day equity prices plunged. It seems that our coupon clippers came to the conclusion "Gosh dang it Ginny! We might just own all crazy asset our equity friends no longer want"! The put option is about to be deployed.

Not happy with the regression coefficients in the above table, I added a feature "Create Dummy Regression". Why am I not happy.? Note that the credit spread (Constant) is actually lower than in the June 15, 2020 to Oct 29, 2020 period than in the following period. The slope of the credit spread is thus more important than the constant.

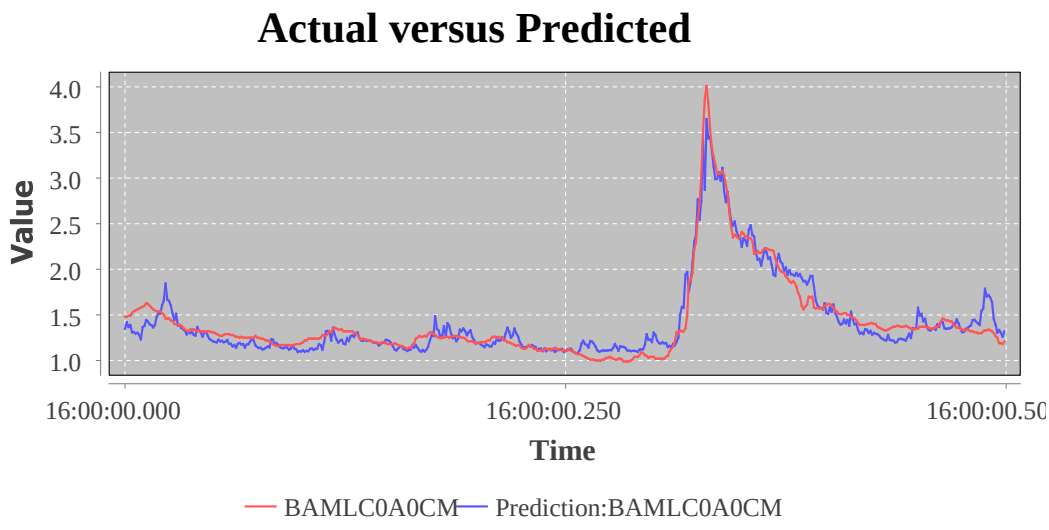
Instead, let's take a look at the dummy variable regression for each of the three periods.

Name	Beta	Std.Error	T-Stat
12/14/18-03/11/20	0.719	0.044	16.51
03/11/20-06/16/20	1.067	0.108	9.854
06/16/20-11/12/20	0.531	0.074	7.166
VIXCLS	0.031	0.002	13.212
R-Square	0.921		
Adj R-Square	0.992		
Durbin Watson	0.428		

Now that table is more intuitive. The constant for the second regression period is 1.078 or 28 basis points higher than the pre-pandemic period in line 1.

Finally after all the Federal stimulus and bailouts credit spreads (as represented by the dummy variable), in the subsequent third period were crushed (1.078 to 0.547). Using dummy variables, we hold the slope constant for all three periods or 3 basis points per VIX point. Only slightly different than our original equation.

Here is the actual versus fitted graph. Not too shabby with an R-Square of 0.993!!



Note the last gap in the set of data points. Equity traders are rather excited about the election. Coupon clippers not so much.

Cheers and stay healthy