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Security Analysis

The Low-Volatility Anomaly: Market Evidence on Systematic Risk vs. Mispricing

In the market, people are always trying to come up with new strategies to get an edge on the competition. Analyst are always comparing strategies to see which one works out the best. I came across a great article called The Low-Volatility Anomaly: Market Evidence on Systematic Risk vs. Mispricing by Xi Li, Rodney N. Sullivan, and Luis Garcia-Feijoo. They wanted to explore whether the well-publicized anomalous returns associated with low-volatility stocks can be attributed to market mispricing or to compensation for higher systematic risk. Researchers have discovered positive connection between future stock returns and various measures of prior stock price variability, which includes total return volatility, idiosyncratic volatility, and beta. They also realized that in both US and international markets, future stock returns with previously low-return-variability portfolios significantly outperform those of previously high-return-variability portfolios. This throws off the economic theory which states the higher the risk the higher the expected return. These researchers realize they need to gain a better understanding of the substructures of this curious anomaly. Which is why these authors want to understand more about the low-volatility anomaly.

More on the low-volatility anomaly, Fischer Black explained an early theoretical interpretation of why low-risk stocks might do so well relative to high-risk stocks. Black showed that a delegated agent mispricing arising from such borrowing restrictions as margin requirements might cause low-beta stocks to outperform. Now, people are questioning that argument by saying that the low-volatility anomaly is likely due to some pervasive systematic risk factors directly associated with volatility. For example, Clarke, de Silva, and Thorley proposed that idiosyncratic volatility is a potential additional risk factor to

which portfolio managers should pay attention. They also found that the excess return to idiosyncratic-volatility stocks is immaterial over the full sample period, saying the investors have historically not been rewarded for bearing these risk over a long period. In the more recent years, they found that exposure to low-idiosyncratic-volatility stocks benefited investors, although the evidence of cross-sectional idiosyncratic volatility is weak. Ang et al. found evidence of an idiosyncratic volatility anomaly in numerous countries and found out that the effect is highly correlated with that in the United States. Explaining that such an effect could be driven by latent systematic risks, they showed that abnormal return generated by idiosyncratic-volatility-based portfolio strategies in international markets strongly co-move with those in US markets, implying a common risk factor. The finding of the co-movement suggests that the return-predictive power of idiosyncratic risk is likely due to some pervasive risk factor.

Others still have argued that the low-volatility anomaly is likely due to mispricing, which maybe has to do with an imperfection such as investor irrationality connected with idiosyncratic volatility. In this case of mispricing, the profit opportunity may be ephemeral as investors come to understand their mental error. Another way would be lasting pricing supported over time by high costs of away the arbitraging anomalous returns. For example, Li et al. showed that the efficacy of trading low-volatility factor is somewhat limited owing to the high costs to arbitrage that are directly associated with attempting to extract the anomalous excess returns. In the article, they talk about how the anomalous effect is supported by behavioral considerations. Similar to what Fischer Black explained, Baker proposed an explanation consistent with biases that originate in investor behavior based on a delegated asset management model. What they showed was, institutional client mandates discourage arbitrage activity that would otherwise potentially eliminate the low-volatility effect. Then Frazzini and Pedersen showed that a betting against beta factor, which long leveraged low-beta assets, produces significant positive risk-adjusted returns. Their analysis showed that more constrained investors hold riskier assets,

leading them to bid up high-beta assets. They ended up finding out that high beta is associated with low alpha for US equities, 20 international equity markets, Treasury bonds, corporate bonds, and futures.

In the article they explain their study by, instead of debating whether previously low-volatility stocks can explain future returns empirically, we asked whether there is a pervasive systematic factor directly associated with return variability. They then had their focus on the outperformance of securities with low idiosyncratic volatility, a phenomenon reported in Ang et al. Put differently, the abnormal returns that researchers have documented for low-volatility portfolios could be due to the portfolios' exposure to some not-yet-understood common risk component. For example, high-volatility stocks may offer consumption-hedging benefits by performing better during weak economic conditions. Supposedly, investors would be willing to pay more for stocks with such hedging benefits. On the other hand, investors would buy only low-volatility stocks if they offered a higher expected return, given that their exposure to systematic risk causes them to deliver poor returns when cash flows are most valued by investors. Otherwise, investors may prefer high-volatility stocks to low-volatility stocks, perhaps owing to cognitive biases or some other not-yet-understood reason.

To determine which of the two explanations, mispricing or systematic risk, better elucidates the low-risk effect, they investigated whether the low-risk anomaly represents returns to some not-yet-identified risk factor or instead is related to the characteristic of low risk itself. They used the same methodologies as other researchers used to test whether the low-volatility anomaly is associated with a mispricing or a pervasive systematic risk. They performed test regarding characteristics versus covariances. Using these tests. They were able to examine whether variations in the loadings on a factor created on the basis of volatility can explain future stock returns after controlling for actual return variability.

For the systematic risk explanation of the volatility anomaly to be valid, stocks with a high loading on the low-volatility factor should outperform stocks with a low loading on the low-volatility factor. This should be observed irrespective of the absolute level of stock volatility. However, after controlling for the observed level of return variability, loadings on the low-volatility factor are unable to explain cross-sectional stock returns, we can reasonably conclude that the low-volatility anomaly is consistent with market mispricing. What they found is the low- volatility anomaly is not due to some systematic risk factor and there is no return premium associated with a factor formed on the basis of volatility. Furthermore, they found that the pricing of the characteristic itself can better explain the outperformance of low-volatility stocks, suggesting a market mispricing. Their findings provide information into the well documented excess returns to various low-risk anomalies, information that can enable investors to improve portfolio construction and risk management by a better understanding of the source of the anomalous returns over time and across companies.

In conclusion, the authors did some thorough analysis on which characterizes the link between low volatility and future returns. Researchers have found that strategy of buying previously low-volatility stocks and selling previously high-volatility stocks has historically generated substantial abnormal returns in US and international markets. Their analysis offer important insights into whether the anomalous low-risk effects are driven by systematic risks or market mispricing. The asset pricing literature provides diagnostic methods for evaluating the source and mechanisms that drive a particular anomalous effect. They used these descriptive procedures to examine whether the return patterns of volatility characteristic-sorted portfolios are consistent with a factor model or with mispricing. Their results explain that market mispricing best characterizes the link between low volatility and future returns, which suggests that the high anomalous returns of low-volatility portfolios identified in the literature cannot be viewed as compensation for some hidden risk factor. Investors appear to prefer high-volatility stocks to low-volatility stocks.

Table 1. Summary Statistics for Relevant Variables, 1966-2011						
Variable	IVOL Factor	High B IVOL- Low B IVOL	High B CAPM - Low B CAPM	Rm - Rf	HML	SMB
A. Statistic						
Mean	0.66%	-0.01	0.02	0.41	0.37	0.25
Standard deviation	5.53%	4.43	6.5	4.64	2.98	3.21
Quartile 3	3.02	2.51	3.72	3.56	1.78	2.17
Median	0.63	0.02	-0.26	0.75	0.37	0.07
Quartile 1	-1.62	-2.29	-3.61	-2.31	-1.3	-1.59
B Correlations						
IVOL factor	1	0.68***	-.79***	-.56***	.51***	-.61***
High B IVOL- Low B IVOL		1	-.71***	-.47***	.32***	-.42***
High B CAPM - Low B CAPM			1	.67***	-.5***	.51***
Rm - Rf				1	-.31***	.31***
HML					1	-.23***
*** Significant at the 1% level						

Table 1 represents the summary statistics for the relevant variables, including a correlation matrix. Panel B of table 1 shows that the absolute correlations between the IVOL factor and the other portfolio characteristics and moderately high to high. They explain how relatively high absolute correlations in Table 1 are not surprising. Measures of stock return variability are likely to be correlated, and the summary statistics reported in Table 1 do not control for important company characteristics, such as market capitalization. They conducted a variety of analyses designed to disentangle the effects of IVOL risk from other well-known factors.

Table 2. Risk and Return of IVOL Portfolios, 1966-2011 (t-statistics in parenthesis)

IVOL Quintile	EWRet	VWRet	IVOL	C CAPM	B IVOL
1 (Low)	1.14%	.88%	4.37%	.79%	.15%
2	1.31	.92	7.46	1.02	.06
3	1.41	.94	10.5	1.2	-.05
4	1.44	.83	14.86	1.34	-.19
5(high)	1.78	.24	28.22	1.4	-.31
High - Low	.64**	-.64**	.61***	.61***	-.046***
	2.11	-2.2	29.44	29.44	-34.45

** Significant at the 5% level

*** Significant at the 1% level

Table 2 explains more information about key variables and how they are sorted into quintiles on the basis of the IVOL characteristics; the sample period is 1966-2011. “EWRet” and “VWRet” represent the average raw returns for equal-weighted and value-weighted quintiles, respectively. They computed “IVOL” as the IVOL from regressions of excess returns on the three Fama-French factors, multiplying it by the square root of the number of trading days in a month to convert it to a monthly measure. It also shows, average value-weighted returns (VWRet) decline from the lowest-IVOL quintile to the highest-IVOL quintile, a finding consistent with the notion that low-risk stocks outperform high-risk stocks, on average.