



Meet the Expert

Volatility Risk Premium



Roni Israelov

Principal, AQR

Ph.D., M.S., Carnegie Mellon University

M.S., Georgia State University

B.S., Georgia Institute of Technology

Q What is the volatility risk premium (VRP), and why does it exist?

A The volatility risk premium is an academic term for the idea that option prices tend to be higher than their expected payouts. I think it's easiest to view the options market as a financial insurance market. Option buyers purchase insurance, striving to protect their portfolio against large losses, and option sellers underwrite that protection. Like any insurance market, option markets have to clear — every buyer requires a seller — and option prices tend to be elevated in order to entice sellers to underwrite the financial insurance protection that buyers seek.

There's also a behavioral element to the VRP. According to a number of surveys conducted by Yale over the past few decades, it appears that equity investors have heightened views of the probability of large equity crashes. This disproportionate fear of a crash can also potentially lead to higher option prices, by increasing the demand for protection and reducing the supply for insurance underwriting.

Actually, the performance of owning options tends to be related to changes in volatility. In everyday markets, we expect to see insurance underwriters — option sellers — realize positive returns as they collect option (or insurance) premiums. But when volatility rapidly spikes, we expect option sellers to see losses as they pay out claims to option buyers. This relationship between performance and the market's volatility is why academics have chosen to refer to this as the volatility risk premium.

Q How is the VRP similar to other alternative risk premia, such as value, momentum, or carry?

A First and foremost, like other alternative risk premia, the VRP is backed by decades of academic research, empirical evidence, and strong economic intuition for why it exists and why we should expect it to continue to exist in the future.

The VRP is similar to other alternative risk premia in that we expect it to have low correlation to traditional risk premia over the long run. This means that it is a diversifying exposure. But it's also worth pointing out that the VRP has low correlation to other factors, such as value, momentum, carry, trend following, etc. This enhances the diversification benefits of including a VRP allocation in a portfolio.

Another similarity between the VRP and other alternative risk premia is the importance of craftsmanship when constructing portfolios. You can invest in value by buying a cheap stock and selling an expensive stock or harvest the volatility risk premium by selling an index option. That's relatively straightforward. But to harvest these risk premia in a risk-managed way that respects the nuances and complexities of the underlying markets requires expertise.



Meet the Expert: **Roni Israelov**

Q Which asset classes or instruments can be used to harvest VRP?

A As a rule of thumb, the VRP is harvested by selling options. Liquid option markets exist globally in a number of different asset classes, including equities and fixed income. There is broad evidence that options across these global equity and fixed income markets reflect a VRP.

We are strong advocates of diversification and risk management, and our strategy reflects this.

Q How does AQR implement this strategy?

A The implementation depends on an investor's objectives. Some investors want a pure allocation to the VRP and can invest in a portfolio that only includes VRP, at a higher risk target. Other investors want a diversified allocation to factors, including VRP, and can invest in a portfolio with a modest allocation to VRP. One of the more frequently used solutions is implementing VRP alongside some amount of equities (a 0.5 beta equity portfolio is quite common). This can serve as a defensive equity portfolio or a hedge fund replacement. Finally, a small volatility risk premium overlay can be used to enhance a 1.0 beta equity portfolio. The primary difference across all of these solutions is how the VRP positions are sized and what else is included in the portfolio.

Q How is AQR's approach different from other investment managers?

A I think we have a truly unique offering with many areas of differentiation. Let me highlight just a few. First, we are strong advocates of diversification and risk management, and our approach reflects this. Most investment managers who harvest the VRP do so only in equity markets, and even still, often only in the S&P 500 Index. We diversify by harvesting the risk premium in both equity and fixed income markets and do so globally within each market. And in each specific market in which we sell options, we strive to diversify further by selling options across multiple strikes and multiple option maturities.

Second, we focus a great deal of attention on risk management. We understand that when we sell options, we are underwriting financial insurance, and we size positions accordingly, being cognizant of our exposures when markets are really suffering. We also manage the risk of our short option positions by hedging their exposures to their underlying markets.

And third, our portfolio construction decisions are backed by rigorous research, much of which we have published. The transparency we offer to investors regarding our methodology and our publicly available research is another important area of differentiation.

Q Where does VRP fit in an investor's portfolio? What should they expect from it?

A I think it goes back to investor objectives. Those who are seeking either a pure allocation to the VRP, or an allocation as part of a diversified alternative risk premia portfolio, would generally place it in their alternatives portfolio. Others who are seeking either an equity replacement or a hedge fund replacement may turn to the volatility risk premium solution that includes equity beta and then place the portfolio within the respective bucket. And those who are looking to enhance their equity portfolio with a volatility risk premium overlay would generally place that in their equity bucket.



Meet the Expert: **Roni Israelov**

In terms of performance, investors should expect the profile of an insurance underwriting portfolio. More often than not, and on average, they should expect to see positive returns. But occasionally, when volatility spikes, they should expect to see larger losses. It's hard to imagine how a healthy options market could function otherwise. Why would a buyer be willing to pay a premium without seeing gains during market stress? Why would a seller be willing to underwrite the insurance without an expectation of profit and attractive risk-adjusted returns? We expect both to be true and to be reflected in the performance properties of a volatility risk premium portfolio.

For more on Volatility Risk Premium, visit our Learning Center at aqr.com/LearningCenter.

Roni Israelov oversees AQR's volatility trading strategies and the management of related portfolios. His research on options has been published in a number of journals, including *Financial Analysts Journal* and the *Journal of Portfolio Management*. He shared the Graham & Dodd Award for the paper "International Diversification Works (Eventually)" published in *Financial Analysts Journal* and was inducted into the EQDerivatives Volatility Investing Hall of Fame in 2017 for his thought leadership on volatility investing. Prior to AQR, he was a research analyst in the quantitative equities strategies group at Lehman Brothers. Roni earned a B.S. in mechanical engineering from Georgia Institute of Technology, an M.S. in mathematical risk management from Georgia State University, and an M.S. in finance and a Ph.D. in financial economics from Carnegie Mellon University.

Disclosures

The information set forth herein has been obtained or derived from sources believed by AQR Capital Management, LLC ("AQR"), to be reliable. However, AQR does not make any representation or warranty, express or implied, as to the information's accuracy or completeness, nor does AQR recommend that the attached information serve as the basis of any investment decision. This document has been provided to you solely for information purposes and does not constitute an offer or solicitation of an offer, or any advice or recommendation, to purchase any securities or other financial instruments, and may not be construed as such. This document is intended exclusively for the use of the person to whom it has been delivered by AQR, and it is not to be reproduced or redistributed to any other person.

Diversification does not eliminate the risk of experiencing investment losses.

The investment strategy and themes discussed herein may be unsuitable for investors depending on their specific investment objectives and financial situation.

AQR Capital Management, LLC
As of 10/23/2018